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The effects of a 12-week plyometric training program on selected motor skills in 11–13-year-old male basketball players

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Abstract

The purpose of this study was to examine the effects of a 12-week plyometric training program on motor skills in 11–13-year-old male basketball players. A total of 24 participants took part in the study. The experimental group performed systematic plyometric training sessions, while the control group continued with regular basketball training. Pre- and post-test assessments included flexibility, sprint, agility, vertical jump, and aerobic endurance. The findings indicated significant improvements in agility, sprint, and vertical jump performance in the experimental group ($p < .05$), whereas no significant difference was observed in flexibility. In conclusion, plyometric training can effectively enhance motor skills in young basketball players, although its impact on flexibility remains limited.

Introduction

Basketball is widely regarded as a dynamic and multifactorial sport, requiring the integration of speed, agility, explosive strength, coordination, and endurance within a single performance setting. These diverse motor demands mean that training strategies must be carefully structured to support the development of multiple physical qualities simultaneously. This is particularly important in young athletes, where the early stages of growth and maturation represent critical windows of opportunity for motor skill acquisition and long-term athletic development (Bompa & Buzzichelli, 2019; Lloyd & Oliver, 2012). Childhood and early adolescence are characterized by heightened neuroplasticity and adaptive potential; consequently, well-designed training interventions during this period may not only enhance current performance but also contribute to future sporting success and injury resilience (Faigenbaum et al., 2013; Lloyd et al., 2014).

Among the different conditioning approaches available, plyometric training has received growing attention for its effectiveness in developing explosive power and sport-specific motor abilities. Plyometric exercises exploit the stretch–shortening cycle of the muscle–tendon complex, enabling athletes to produce greater force in a shorter time frame. This neuromuscular mechanism underpins several performance-related skills, including sprint acceleration, change of direction speed, and vertical jump performance (de Villarreal et al., 2009; Markovic & Mikulic, 2010). A substantial body of evidence suggests that plyometric interventions, when systematically applied, can elicit meaningful improvements in sprinting, agility, and jumping ability in both adolescent and preadolescent populations (Chaabene & Negra, 2017; Asadi et al., 2017; Moran et al., 2017a). However, concerns have also been raised regarding safety and programming variables, particularly in young athletes. Issues such as exercise selection, progression, intensity, and recovery periods must be carefully considered to ensure positive adaptations without compromising musculoskeletal health (Behm et al., 2008; Lloyd et al., 2014).

In the specific context of basketball, motor skills such as short-distance sprints, rapid directional

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changes, vertical jumping, and flexibility during ball-handling are central to game performance (Abdelkrim et al., 2007; Ziv & Lidor, 2010). Since these qualities are highly trainable during early adolescence, plyometric training represents a potentially valuable method to enhance basketball-specific performance capacities. Previous studies have highlighted that athletes in the 11–13-year-old age range are particularly receptive to neuromuscular stimuli, and improvements in explosive strength and speed during this period can contribute significantly to both immediate and long-term athletic development (Granacher et al., 2016; Moran et al., 2017b).

Considering these aspects, the present study aimed to examine the effects of a 12-week plyometric training program on selected motor skills in 11–13-year-old male basketball players. Although numerous studies have explored plyometric training in youth and adolescent populations, evidence focusing specifically on preadolescent basketball players remains scarce. Addressing this gap, the present investigation sought to determine whether systematic plyometric training could produce superior improvements in sprint performance, agility, and vertical jump compared with regular basketball training. The findings are expected to provide practical insights for coaches and sport scientists seeking to optimize age-appropriate conditioning strategies in youth basketball.

Methods

Participants

A total of 24 male basketball players without any health problems voluntarily participated in this study. All participants had a minimum of two years of organized basketball training experience and were actively competing at the regional youth level at the time of the study. None of the athletes had previously participated in a structured plyometric training program. The participants were randomly assigned to either the experimental group (n = 12; mean age = 12.00 ± 0.53 years; height = 153.6 ± 2.67 cm; body mass = 45.47 ± 1.76 kg) or the control group (n = 12; mean age = 11.87 ± 0.51 years; height = 155.6 ± 1.35 cm; body mass = 45.80 ± 1.78 kg) using a computer-generated random number sequence. Randomization was conducted by an independent researcher who was not involved in the training or testing procedures to minimize potential allocation bias.

Procedure

Prior to the study, detailed information regarding the research objectives and procedures was provided to both the participants and their parents. Written informed consent was obtained from the parents or legal guardians, and written assent was also obtained from each child participant. The research was conducted in accordance with ethical principles and was approved by the Scientific Research and Publication Ethics Committee of Muş Alparslan University Ethical Committee (15.04.2024-138047). While the experimental group participated in systematic plyometric training sessions, the control group continued with their regular basketball practices. Pre- and post-test assessments included flexibility, sprint performance, agility, vertical jump, and aerobic endurance.

Training Program

Throughout the 12-week intervention, both groups maintained a total training frequency of four sessions per week (Table 1). The experimental group performed two supervised plyometric training sessions in addition to two regular basketball practices, resulting in an average weekly training volume of approximately 4 hours. The control group participated exclusively in four basketball sessions per week, corresponding to a similar total weekly training duration. Each session lasted approximately 60 minutes and was systematically divided into three main phases: warm-up, main exercise, and cool-down.

Warm-up phase (10 minutes): Each session began with approximately three minutes of light jogging to gradually elevate heart rate and body temperature, followed by dynamic mobility and activation exercises focusing on major muscle groups. These activities collectively constituted a 10-minute standardized warm-up phase designed to prepare the athletes for the subsequent plyometric workload.

Main exercise phase: The core component of the program involved plyometric and functional movements. Exercises varied across weeks and included Skater jumps, Burpee Broad Jumps, Lunge to Hop, Star Jumps, Frog Hops, and traditional Lunges. All exercises were performed in 3 sets with a predetermined number of repetitions. The primary objective was to develop essential motor abilities such as strength, speed, agility, coordination, and anaerobic endurance. Exercise variety was intentionally incorporated to ensure balanced muscle group activation and to avoid training monotony, thereby enhancing long-term adaptation.

Basketball-specific training (20 minutes): This section was a constant element of each session, focusing on fundamental basketball skills. Dribbling, passing, and shooting drills were combined with game-based activities aimed at improving both technical proficiency and conditional capacities. In this way, the program contributed not only to general motor development but also to sport-specific performance enhancement.

Cool-down phase (10 minutes): The final part of each training session consisted of low-intensity activities and static stretching exercises. This phase was implemented to facilitate physiological recovery, reduce muscle tension, and support post-training adaptation.

The overall structure of the program was based on a six-week cyclical periodization approach. The set of exercises applied during the first six weeks was repeated from the seventh week onward, allowing participants to gain technical proficiency in movements while promoting physiological adaptation to training stimuli. This design provided a comprehensive framework to simultaneously support general conditioning and sport-specific skill development.

Control group protocol: The control group continued their standard basketball training throughout the 12-week intervention period. Each session lasted approximately 60 minutes and consisted of a 10-minute general warm-up, 40 minutes of basketball-specific drills (including dribbling, passing, defensive footwork, and shooting exercises performed at moderate-to-high intensity), and a 10-minute cool-down with light jogging and stretching. This program reflected the team's regular in-season training routine and matched the experimental group in total weekly training duration.

Measurements

All testing procedures were conducted in the same indoor sports facility under controlled environmental conditions (temperature 22–24 °C, humidity 45–55%). Tests were administered on two consecutive mornings between 09:00 and 11:00 a.m. to minimize circadian variation. Prior to each assessment, participants completed a standardized 10-minute dynamic warm-up. Each test was preceded by a familiarization trial and separated by a 3-minute passive rest interval to avoid fatigue-related effects. Body height and mass were measured using a calibrated digital stadiometer and scale (SECA 769, Germany). Agility was evaluated with the Illinois Agility Test, sprint performance with a 30 m sprint using electronic timing gates (Newtest Powertimer, Finland), vertical jump height with a contact mat system (Just Jump, USA), flexibility via the Sit-and-Reach Test, and aerobic endurance using the 6-Minute Walk Test on a standard indoor court. All measurements were performed by the same experienced researcher to ensure consistency and reliability.

Data Analyses

All data obtained from the study were analyzed using the SPSS 25.0 statistical software package. The Shapiro–Wilk test was applied to verify whether the variables followed a normal distribution. Paired samples t-tests were conducted to compare pre- and post-test results within each group, while independent samples t-tests were used to determine differences between groups. The level of statistical significance was set at $\alpha = 0.05$ for all analyses.

Table 1
Plyometric training program of the experimental group.

1 & 7 Weeks	2 & 8 Weeks	3 & 9 Weeks	4 & 10 Weeks	5 & 11 Weeks	6 & 12 Weeks
Dynamic warm-up (10 min)	Dynamic warm-up (10 min)	Dynamic warm-up (10 min)	Dynamic warm-up (10 min)	Dynamic warm-up (10 min)	Dynamic warm-up (10 min)
Skater3x20	Burpee Broad Jump 3x15	Lunge To Hop 3x15	Skater 3x20	Burpee Broad Jump 3x15	Lunge To Hop 3x15
Lunge 3x20	Star Jumps 3x20	Frog Hops 3x15	Lunge 3x20	Star Jumps 3x20	Frog Hops 3x15
Basketball Training (20 min)	Basketball Training (20 min)	Basketball Training (20 min)	Basketball Training (20 min)	Basketball Training (20 min)	Basketball Training (20 min)
Cool-down (10 min)	Cool-down (10 min)	Cool-down (10 min)	Cool-down (10 min)	Cool-down (10 min)	Cool-down (10 min)
60 min	60 min	60 min	60 min	60 min	60 min

Table 2
Descriptive characteristics of the participants (n=12).

Variables	Groups	Mean ± SD	Min	Max
Age (years)	EG	12.00 ± 0.54	11	13
	CG	11.87 ± 0.52	11	13
Height (cm)	EG	153.6 ± 2.67	149	159
	CG	155.6 ± 1.35	153	158
Body mass (kg)	EG	45.47 ± 1.77	43	49
	CG	45.80 ± 1.78	43	49

EG = Experimental Group; CG = Control Group.

Table 3
Pre- and post-test comparisons of motor performance parameters in Experimental (EG) and Control groups (CG).

Parameters	Pre-test EG	Pre-test CG	Post-test EG	Post-test CG	Group *p*	Time *p*(EG)	Time *p*(CG)
Agility (s)	13.49 ± 1.65	15.37± 1.07	11.24 ± 0.74	14.84 ± 1.09	.008*	.000*	.000*
6MWT (m)	450.67 ± 22.75	462.50 ± 6.59	460.73 ± 21.30	464.00 ± 8.50	.072	.000*	.293
30 m Sprint (s)	4.10 ± 0.32	4.39 ± 0.35	3.58 ± 0.16	4.18 ± 0.28	.015*	.000*	.000*
Flexibility (cm)	24.67 ± 3.68	26.00 ± 1.60	25.00 ± 3.25	26.17 ± 1.64	.152	.265	.615
Vertical Jump (cm)	17.80 ± 0.77	18.42 ± 1.16	18.87 ± 1.13	19.17 ± 1.34	.172	.001*	.021*

*EG = Experimental Group; CG = Control Group; 6MWT = 6-Minute Walk Test. * p < .05 indicates statistical significance.*

Results

The findings of this study are presented in relation to the effects of the 12-week plyometric training program on the motor performance parameters of young basketball players. Descriptive statistics for each group are first provided, followed by comparisons of pre- and post-test outcomes within and between groups.

As presented in Table 3, significant differences were observed in several performance parameters following the 12-week training intervention. In the experimental group, agility, sprint performance, and vertical jump showed statistically significant improvements from pre-test to post-test ($p < .05$). Specifically, agility times decreased from 13.49 ± 1.65 s to 11.24 ± 0.74 s, and 30 m sprint times improved from 4.10 ± 0.32 s to 3.58 ± 0.16 s, while vertical jump height increased from 17.80 ± 0.77 cm to 18.87 ± 1.13 cm. These changes were also reflected in significant group differences when compared with the control group ($p < .05$).

In contrast, flexibility did not demonstrate a statistically significant change in either group ($p > .05$), indicating that the plyometric program had limited effect on this parameter. Aerobic endurance, assessed by the 6-Minute Walk Test, showed a significant improvement over time in the experimental group ($p < .001$); however, between-group differences were not statistically significant ($p = .072$).

Overall, these results indicate that systematic plyometric training had a positive impact on agility, sprint, and explosive power in young basketball players, whereas its effect on flexibility and aerobic endurance was minimal.

Discussion

This study investigated the effects of a 12-week plyometric training program on selected motor skills in 11–13-year-old male basketball players. The findings demonstrated significant improvements in agility, sprint performance, and vertical jump in favor of the experimental group, while no statistically significant changes were observed in flexibility. These results are largely consistent with previous research conducted in different youth populations (Asadi et al., 2016; Negra et al., 2017; Ramírez-Campillo et al., 2019).

The improvement observed in agility may be attributed to the contribution of plyometric training to change-of-direction ability and short-distance acceleration. According to Markovic and Mikulic (2010) and de Villarreal et al. (2009), plyometric exercises strengthen the muscle–tendon complex and maximize the efficiency of the stretch–shortening cycle.

Recent meta-analyses focusing on youth athletes also confirm the effectiveness of plyometric training in enhancing agility (Bedoya et al., 2015; Hammami et al., 2016). Considering the critical role of change-of-direction speed in basketball performance, this finding is of particular importance for coaches (Abdelkrim et al., 2007).

Similarly, the improvement in sprint performance aligns with earlier findings. Research indicates that plyometric training significantly reduces sprint times in young athletes, particularly in distances ranging from 10 to 40 meters (Lloyd et al., 2014; Moran et al., 2017b). Granacher et al. (2016) emphasized that supporting strength and speed development during critical growth phases is essential for long-term athletic progression. The present results, showing significant improvements in 30 m sprint performance among the experimental group, further support the notion that preadolescent athletes are highly responsive to training stimuli (Faigenbaum et al., 2013; Jaksic et al., 2023).

The increase in vertical jump performance reinforces the role of plyometric training in developing explosive strength. Previous studies have shown that 8–12 weeks of plyometric training significantly improves vertical jump height in adolescent athletes (Campo et al., 2009; Chelly et al., 2010). Furthermore, systematic reviews have highlighted the consistent positive effects of plyometric programs performed on various surfaces and with different intensities (Chaabene & Negra, 2017). These improvements may be explained by enhanced neuromuscular coordination, increased tendon elasticity, and greater motor unit recruitment in the lower extremities (Moran et al., 2017a; Turner & Jeffreys, 2010).

In contrast, no significant improvements were observed in flexibility. This outcome is not surprising, as plyometric training primarily targets strength, speed, and explosive power rather than flexibility development (Behringer et al., 2011; Chaouachi et al., 2014). Flexibility is more effectively enhanced through static or dynamic stretching protocols, which are only minimally included in plyometric programs (Santos et al., 2008; Mayorga-Vega et al., 2016). Therefore, the lack of significant changes in flexibility is consistent with previous findings.

One of the strengths of the present study is the implementation of a relatively long-term (12-week) structured plyometric program in a youth population. Nevertheless, limitations include the small sample size and the inclusion of only male participants, which may restrict the generalizability of the findings. Future studies should address these limitations by incorporating larger and more diverse samples across different age groups and genders (Hammami et al., 2017; Rössler et al., 2014). Additionally, integrating biomechanical and electrophysiological assessments may provide deeper insights into the underlying mechanisms of plyometric adaptations.

Conclusion

This study demonstrated that a 12-week plyometric training program improved agility, sprint performance, and vertical jump ability in 11–13-year-old male basketball players. However, no significant changes were observed in flexibility. These findings emphasize the importance of incorporating plyometric training into youth basketball programs to enhance sport-specific motor skills and support long-term athletic development. However, the study's relatively small sample size and inclusion of only male participants should be considered when interpreting the results. Future research should aim to include larger and more diverse cohorts and explore the long-term effects of plyometric training through extended follow-up assessments.

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Authors Contribution

Study Design: MFB, AY; Data Collection: MFB, AY; Statistical Analysis: MFB; Manuscript Preparation: MFB, AY

Ethical Approval

The study was approved by the Muş Alparslan University Ethical Committee (15.04.2024-138047) and it was carried out in accordance with the Code of Ethics of the World Medical Association also known as a declaration of Helsinki.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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References

Abdelkrim, N. B., El Fazaa, S., & El Ati, J. (2007). Time–motion analysis and physiological data of elite under-19-year-old basketball players during competition. *Br J Sports Med*, 41(2), 69-75. doi: 10.1136/bjsm.2006.032318

Asadi, A., Arazi, H., Ramirez-Campillo, R., Moran, J., & Izquierdo, M. (2017). Influence of maturation stage on agility performance gains after plyometric training: a systematic review and meta-analysis. *J Strength Cond Res*, 31(9), 2609-2617. doi: 10.1519/JSC.0000000000001994

Asadi, A., Arazi, H., Young, W. B., & de Villarreal, E. S. (2016). The effects of plyometric training on change-of-direction ability: A meta-analysis. *Int J Sports Physiol Perform*, 11(5), 563-573. doi: 10.1123/ijspp.2015-0694

Bedoya, A. A., Miltenberger, M. R., & Lopez, R. M. (2015). Plyometric training effects on athletic performance in youth soccer athletes: a systematic review. *J Strength Cond Res*, 29(8), 2351-2360. doi: 10.1519/JSC.0000000000000877

Behm, D. G., Faigenbaum, A. D., Falk, B., & Klentrou, P. (2008). Canadian Society for Exercise Physiology position paper: Resistance training in children and adolescents. *Appl Physiol Nutr Metab, 33*(3), 547–561. doi: 10.1139/H08-020

Behringer, M., vom Heede, A., Matthews, M., & Mester, J. (2011). Effects of strength training on motor performance skills in children and adolescents: a meta-analysis. *Pediatr Exerc Sci*, 23(2), 186–206. doi: 10.1123/pes.23.2.186

Bompa, T. O., & Buzzichelli, C. (2019). *Periodization: Theory and methodology of training* (6th ed.). *Human Kinetics*.

Campo, S. S., Vaeyens, R., Philippaerts, R. M., Redondo, J. C., de Benito, A. M., & Cuadrado, G. (2009). Effects of lower-limb plyometric training on body composition, explosive strength, and kicking speed in female soccer players. *J Strength Cond Res*, 23(6), 1714-1722. doi: 10.1519/JSC.0b013e3181b3f537

Chaabene, H., & Negra, Y. (2017). The effect of plyometric training volume on athletic performance in prepubertal male soccer players. *Int J Sports Physiol Perform*, 12(9), 1205-1211. doi: 10.1123/ijspp.2016-0372

Chaouachi, A., Hammami, R., Kaabi, S., Chamari, K., Drinkwater, E. J., & Behm, D. G. (2014). Olympic weightlifting and plyometric training with children provides similar or greater performance improvements than traditional resistance training. *J Strength Cond Res*, 28(6), 1483-1496.

Chelly, M. S., Ghenem, M. A., Abid, K., Hermassi, S., Tabka, Z., & Shephard, R. J. (2010). Effects of in-season short-term plyometric training program on leg power, jump- and sprint performance of soccer players. *J Strength Cond Res*, 24(10), 2670-2676. doi: 10.1519/JSC.0b013e3181e2728f

De Villarreal, E. S. S., Kellis, E., Kraemer, W. J., & Izquierdo, M. (2009). Determining variables of plyometric training for improving vertical jump height performance: a meta-analysis. *J Strength Cond Res*, 23(2), 495-506. doi: 10.1519/JSC.0b013e318196b7c6

Faigenbaum, A. D., Lloyd, R. S., & Myer, G. D. (2013). Youth resistance training: past practices, new perspectives, and future directions. *Pediatr Exerc Sci*, 25(4), 591-604. doi: 10.1123/pes.25.4.591

Granacher, U., Lesinski, M., Büsch, D., Muehlbauer, T., Prieske, O., Puta, C., ... & Behm, D. G. (2016). Effects of resistance training in youth athletes on muscular fitness and athletic performance: a conceptual model for long-term athlete development. *Front Physiol*, 7, 164. doi: 10.3389/fphys.2016.00164

Hammami, M., Negra, Y., Aouadi, R., Shephard, R. J., & Chelly, M. S. (2016). Effects of an in-season plyometric training program on repeated change of direction and sprint performance in the junior soccer player. *J Strength Cond Res*, 30(12), 3312-3320. doi: 10.1519/JSC.0000000000001470

Hammami, R., Granacher, U., Pizzolato, F., Chaouachi, M., & Chtara, M. (2017). Associations between change of direction, balance, speed, and muscle power in prepubescent soccer players. *J Athl Enhanc*, 6(6). doi: 10.4172/2324-9080.1000279

Jakšić, D., Maričić, S., Maksimović, N., Bianco, A., Sekulić, D., Foretić, N., & Drid, P. (2023). Effects of additional plyometric training on the jump performance of elite male handball players: a systematic review. *Int J Environ Res Public Health*, 20(3), 2475. doi: 10.3390/ijerph20032475

Lloyd, R. S., & Oliver, J. L. (2012). The youth physical development model: A new approach to long-term athletic development. *Strength Cond J*, 34(3), 61-72. doi: 10.1519/SSC.0b013e31825760ea

Lloyd, R. S., Faigenbaum, A. D., Stone, M. H., Oliver, J. L., Jeffreys, I., Moody, J. A., ... & Myer, G. D. (2014). Position statement on youth resistance training: the 2014 International Consensus. *Br J Sports Med*, 48(7), 498-505. doi: 10.1136/bjsports-2013-092952

Markovic, G., & Mikulic, P. (2010). Neuro-musculoskeletal and performance adaptations to lower-extremity plyometric training. *Sports Med*, 40(10), 859-895. doi: 10.2165/11318370-000000000-00000

Mayorga-Vega, D., Merino-Marbán, R., Manzano-Lagunas, J., Blanco, H., & Viciana, J. (2016). Effects of a stretching development and maintenance program on hamstring extensibility in schoolchildren: A cluster-randomized controlled trial. *J Sports Sci Med*, 15(1), 65–74.

Moran, J., Sandercock, G. R., Ramirez-Campillo, R., Meylan, C. M., Collison, J. A., & Parry, D. A. (2017a). Age-related variation in male youth athletes' countermovement jump after plyometric training: a meta-analysis of controlled trials. *J Strength Cond Res*, 31(2), 552-565. doi: 10.1519/JSC.0000000000001444

Moran, J., Sandercock, G. R. H., Rumpf, M. C., & Parry, D. A. (2017b). Variation in responses to sprint training in male youth athletes: A meta-analysis. *Int J Sports Med, 38*(1), 1–11. doi: 10.1055/s-0042-111439

Negra, Y., Chaabene, H., Sammoud, S., Bouguezzi, R., Abbes, M. A., Hachana, Y., & Granacher, U. (2017). Effects of plyometric training on physical fitness in prepuberal soccer athletes. *Int J Sports Med*, 38(05), 370-377. doi: 10.1055/s-0042-122337

Ramirez-Campillo, R., Alvarez, C., García-Pinillos, F., Gentil, P., Moran, J., Pereira, L. A., & Loturco, I. (2019). Effects of plyometric training on physical performance of young male soccer players: potential effects of different drop jump heights. *Pediatr Exerc Sci*, 31(3), 306-313. doi: 10.1123/pes.2018-0207

Rössler, R., Donath, L., Verhagen, E., Junge, A., Schweizer, T., & Faude, O. (2014). Exercise-based injury prevention in child and adolescent sport: a systematic review and meta-analysis. *Sports Med*, 44(12), 1733-1748. doi: 10.1007/s40279-014-0234-2

Santos, E. J., & Janeira, M. A. (2008). Effects of complex training on explosive strength in adolescent male basketball players. *J Strength Cond Res*, 22(3), 903-909. doi: 10.1519/JSC.0b013e31816a59f2

Turner, A. N., & Jeffreys, I. (2010). The stretch-shortening cycle: Proposed mechanisms and methods for enhancement. *Strength Cond J*, 32(4), 87-99. doi: 10.1519/SSC.0b013e3181e928f9

Ziv, G., & Lidor, R. (2010). Vertical jump in female and male basketball players-A review of observational and experimental studies. *J Sci Med Sport*, 13(3), 332-339. doi: 10.1016/j.jsams.2009.02.009