Jurnal Perjuangan dan Pengabdian Masyarakat: JPPM
Volume 2 No 2 Tahun 2026
Halaman: 9- 16

Basic Heading Techniques Training for FIKK UNM Students as the Foundation of Individual Abilities

M. Said Zainuddin[1]*, Arifuddin Usman[2], Ahmad Zakaria[3], Benny Badaru4, Awaluddin[5]
[12345]Universitas Negeri Makassar, Makassar, Indonesia

saidzainuddin@unm.ac.id; arifuddin.usman@unm.ac.id;
ahmad.zakaria@unm.ac.id; benny.b@unm.ac.id; awaluddin@unm.ac.id

*Coresponding Author: saidzainuddin@unm.ac.id
Received: 02-05-2025; Revised: 14-05-2026; Accepted: 26-05-2026

Abstrak

Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan keterampilan teknik dasar heading yang aman dan efektif bagi mahasiswa FIKK UNM sebagai fondasi kemampuan individu dalam sepakbola. Program ini merespons kebutuhan akan penguasaan teknik yang benar guna meminimalisir risiko cedera kepala subkonkusif melalui pendekatan biomekanika dan penguatan otot leher. Pelatihan dilaksanakan melalui tahapan sistematis mulai dari adaptasi sensorik, teknik statis, hingga teknik dinamis yang terprogram dan terarah. Hasil yang diharapkan adalah mahasiswa memiliki kompetensi teknis yang unggul serta pemahaman mendalam mengenai protokol keselamatan FIFA (SCAT6/CRT6) sebagai standar profesionalisme di lapangan.

Kata Kunci: Heading; FIKK UNM; Keselamatan Olahraga; Mahasiswa

Abstract

This community service initiative aims to enhance safe and effective fundamental heading skills among FIKK UNM students, serving as a cornerstone for individual soccer proficiency. The program addresses the critical need for technical mastery to mitigate the risk of repetitive subconcussive head injuries by integrating biomechanical principles and neck muscle strengthening protocols. The training is delivered through a systematic progression, transitioning from sensory adaptation to structured and directed static and dynamic techniques. The anticipated outcomes include the attainment of superior technical competence and a comprehensive understanding of FIFA safety protocols (SCAT6/CRT6) as a benchmark for professional conduct on the field. Accurate worthless, easy to read, and concise, followed by up to 5 keywords, separated by semicolons.

Keywords: Heading; FIKK UNM; Sports Safety; Concussion, Student.

Jurnal Perjuangan dan Pengabdian Masyarakat: JPPM
Volume 2 No 2 Tahun 2026
Halaman: 9- 16

INTRODUCTION

The implementation of community service programs within the scope of sports higher education institutions requires a multidisciplinary approach that integrates the principles of biomechanics, sports pedagogy, and preventive health protocols (Janna et al., 2025). Faculty of Sports Sciences and

The Department of Health (FIKK) of the State University of Makassar (UNM), bears a great responsibility in producing professional graduates who are not only technically competent, but also have a high awareness of athlete safety. This basic head-to-head coaching program as the foundation of individual abilities is designed to address these challenges, given the high frequency of head-to-ball contact in football and the neurological risks that come with it. Therefore, an in-depth understanding of effective training methods, techniques, and strategies in improving individual abilities is very important (Zainuddin et al., 2024).

The technique of heading the ball is not just a motor skill, but a manifestation of an athlete's courage and self-control in facing the dynamics of the air game (Oktavianus, 2024). In sports philosophy, mastery of basic techniques is analogous to the foundation of a house (Zainuddin et al., 2025), without a solid foundation, the achievement structure built on it will easily collapse when faced with high competition pressure. As the only sport that legally allows the use of the head to manipulate moving objects at high speeds, football demands a perfect integration between visual perception, kinesthetic timing, and the structural stability of the body. Mastery of the correct heading technique is a symbol of individual technical maturity who is able to change the direction of the match while maintaining his physical integrity.

Analysis of the situation at FIKK UNM shows that the transition from amateur players to professional level or sports educators demands perfect mastery of basic techniques. The FIKK UNM Stadium located on Jalan Wijaya Kusuma No. 14 Makassar, with a natural grass surface, is a strategic facility to disseminate this knowledge directly to students who are members of the Physical Education Health and Recreation (PJKR), Sports Coaching Education (PKO), and Sports Science (IKOR) study programs. This training is not just a physical routine, but a systematic effort to build a solid foundation of individual abilities through an understanding of the biomechanics of head-neck-torso stabilization.

Safety in ball heading technique is very depend on the ability of the neuromuscular system to mitigate linear and angular acceleration of the head when an impact occurs (Srefle, 2025). Studies (M.Kep et al., 2020) show that excessive head acceleration is directly correlated with the risk of mild traumatic brain injury or concussion. The body's natural protection mechanism involves activating the neck muscles to create a stiffening effect that allows the impact force to be distributed throughout the body mass, rather than just absorbed by the head.

Experienced players show better neck muscle coordination than beginners (Sucipto, 2023). This is achieved through voluntary eccentric

contraction of the sternocleidomastoid muscle in the anterior part of the neck right as contact occurs, followed by stabilization of the trapezius muscle in the posterior part. An imbalance in strength between the flexor and extensor muscles of the neck was found to correlate with increased angular acceleration of the head (Hamka, 2023). Therefore, the main component of this service program is the isometric reinforcement of the neck as an intrinsic risk factor that can be modified (Rosmin, 2023).

More broadly, the urgency of this training is based on the cumulative threat of repetitive subconcussive head impacts that are often overlooked because they do not immediately show real clinical symptoms. Repeated exposure to microshocks over a period of one season or throughout a career has the potential to cause long-term physiological changes, including decreased cognitive function, memory deficits, and structural degradation of brain tissue. Through the convergence between biomechanics, motor control, and motor learning, this training prepares neuromuscular readiness before physical contact occurs. This preventive paradigm not only reduces the risk of degenerative injuries, but also transforms the coaching culture to be more oriented towards the safety of athletes without having to reduce their competitive competitiveness.

METHOD OF IMPLEMENTATION OF ACTIVITIES

In accordance with the Strategic Plan (Renstra) for Community Service in higher education, this program is managed professionally with high accountability. This service activity was carried out starting on April 1 and ending on May 6. The main location of the activity is at the UNM FIKK Field, which has representative facilities for field practice. This training involved 30 students as a sample, who were selected to represent various study programs within the UNM FIKK so that the impact of science dissemination can be spread evenly. Funding sources for service programs through an independent scheme. Targeted outputs include the publication of scientific articles in national service journals.

The proposing team consists of expert lecturers in the field of sports and students who act as field facilitators. Setting an intensive schedule during the period is intended to ensure participants get enough repetitions of exercise to form correct muscle memory without neglecting the recovery phase.

The training adopts a programmed and targeted training model, starting from simple patterns for beginners to more complex situations. The main focus is on the "art of directing the ball" using the forehead, which is recognized as the strongest and flatter area of the human skull.

Phase 1: Ball Feeling and Sensory Adaptation

A crucial first step is to eliminate students' fear of the ball. The coach provides a variation of the "put the head" game, in which students place the ball on their forehead and try to balance it while moving forward, backward, and sideways. This exercise is very effective for practicing eye-ball coordination and

ensuring students get used to keeping their eyes open when the ball approaches their face.

Once static equilibrium is reached, the intensity is increased by throwing the ball in close range. Students are taught to touch the ball using their foreheads without making a big swing, enough to feel the ball feeling. It is important to prevent the bad habit of using the top of the head which is prone to neck injuries and concussions.

Figure 1. Ball Feeling and Sensory Adaptation

Phase 2: Static Heading Technique

After the sensory adaptation is formed, students begin to learn the heading technique with a standing posture. The position of the body should be stable with the legs shoulder-width apart and the knees slightly bent. The movement begins by pulling the head back while tightening the neck muscles, which creates momentum to peck the ball forward.

Coaching points in this phase include using the strength of the abdominal muscles to push the pelvis forward, so that the energy of the header comes from the whole body, not just the neck. Students must ensure that the forehead touches the center of the ball for maximum directional control. Follow-through movements are done by directing your gaze to the target while maintaining balance using your hands stretched to the sides.

Figure 2. Static Heading Technique

Phase 3: Dynamic Heading (Jumping and Diving Heading)

In the advanced stage, students are trained to do headers while jumping (jump heading). This technique requires precise timing between the start of the run, the leg push, and the peak of the jump. The coach should ensure students

jump with both feet for maximum stability in the air and land smoothly to avoid ankle injuries.

Diving heading or floating header is taught as a special technique to reach a low ball in front of the goal. Students are trained to drop their bodies horizontally while keeping their eyes on the ball. Physical courage combined with safe landing techniques using palms and arms to dampen impacts with the ground.

Gambar 3. Dynamic Heading (Jumping and Diving Heading)

IMPLEMENTATION OF ACTIVITIES AND DISCUSSIONS

After participating in intensive structured training for more than 1 month, there was a very significant reconstruction of movement patterns in 30 sample students. In-depth analysis of participants' motor development can be divided based on the stages of motor learning (motor learning phase) and the phases of execution of biomechanical movements as follows:

a. Segmentation of Participants' Motor Learning Phases

Referring to the theory of motor learning, the development of ball heading skills of FIKK UNM students goes through three stages of transition of basic movement development:

1. Cognitive Phase (Movement Preparation): At the beginning of the program (1st week), participants are in a cognitive phase where they have difficulty planning movements and coordinating the orientation of the body towards the direction the ball is coming. Through visual stimulation and sensory adaptation exercises (ball feeling), students began to understand the concept of biomechanics of heading using the frontal bone.
2. Associative Phase (Fixation/Main Phase): In the 3rd to 4th week, there is the elimination of unnecessary movements (such as inefficient head bobbing movements or eye closing reflexes). Students starting to be able to associate the arrival time of the ball (timing) with the swing of the neck synchronously, characterized by the consistency of keeping the eyes open when contact occurs.
3. Autonomous Phase (Final Phase/Optimization): By the end of the training (week 5), the heading movement has been efficiently automated. Participants can make a seamless transition from a steady standing stance to an explosive jump (jumping heading), make precise contact at the peak of the highest jump, and immediately restore balance after landing.

b. Kinetic Chain Analysis of Motion Execution

Ball heading skills are comprehensively evaluated based on the principle of the kinetic chain, which integrates the coordination of the body's multisegments from the lower extremities, torso, to head-neck in a single smooth-flowing pattern of motion:

Pre-impact/Preparation Phase: Students place their feet in a split stance position with their knees bent elastically to maintain the stability of the center of gravity. To store elastic energy, there is hyperextension of the hip joint and rearwards of the trunk extension accompanied by maximum eccentric contraction of the abdominal muscles and neck flexors.

Movement/Impact Phase: Stored elastic potential energy is released explosively through forward pelvic thrust using the force of the abdominal muscles and a balanced contraction between the flexor (sternocleidomastoid) and extensor (trapezius) muscles of the neck. This creates a neck stiffening effect that stabilizes the cervical joint so that the momentum of the upper body mass can be fully channeled to the ball without causing an angular acceleration shock injury of the head. Precise ball contact occurs in the forehead area right at the hairline with the eyes focused on looking at the ball.

Final Phase (Recovery/Follow-Through Phase): After the ball is released, the hamstring muscles and back extensors work eccentrically to slow down the body's oscillations. Participants land on soft landing using both legs bilaterally to distribute the force of impact with the ground, while both hands are extended to the side to quickly restore static balance.

Providing distributed practice intervals with regular recovery intervals during the program period was also shown to significantly increase motor memory consolidation in the participants' motor cortex. Such time lags facilitate neuromuscular adaptation and recovery of muscle fatigue, which is especially important because muscle fatigue has been shown to interfere with fine motor coordination and ball header accuracy.

CONCLUSION

Biomechanical Synergy and Neuromuscular Activation: The key to safe and powerful headings lies in the transfer of energy through a complete segmental kinetic chain. Isometric neck muscle strength training has been shown to minimize linear and angular acceleration of the head by increasing the degree of neck stiffness shortly before the collision occurs.

Transition of Motor Learning Level: Through the distributed practice method, 30 sample students showed significant progress in the motor learning phase. From the cognitive phase characterized by the tendency to close their eyes and head with the top of the head (vertex), participants managed to reach the autonomic phase.

Integration of Physical Competence and Sports Medical Literacy: Students' individual abilities are not only based on ball-heading dexterity, but are also strengthened by independence in detecting and handling the medical risk of head injuries. Through the implementation of the FIFA "Suspect and Protect"

safety protocol, students are no longer just passive sports practitioners, but the responsive vanguard in detecting concussion danger signs.

THANKS

The author expressed his appreciation to the Rector of Makassar State University and the Dean of FIKK UNM for the support of the facility. Thank you also to the Head of the Department for the administrative assistance. The highest award was given to the 30 participating students who have actively participated in a series of trainings at the UNM FIKK Field from April to May, as well as the facilitator team who maintain the smooth operation of the program.

REFERENCE

Hamka, N. A. (2023). Hubungan Antara Craniovertebral Angle dengan Keseimbangan Dinamis dan Head Repositioning Accuracy pada Mahasiswa S1 Fisioterapi Fakultas Keperawatan Universitas Hasanuddin [Other, Universitas Hasanuddin]. https://repository.unhas.ac.id/id/eprint/33516/

Janna, M., Temmassonge, A., & Kurnia, M. F. (2025). Penerapan Prinsip Biomekanika untuk Optimalisasi Performa Atletik Mahasiswa Pendidikan Jasmani. Hybrid: Jurnal Pendidikan Dan Pembelajaran Sains, 4(2), 39–48. https://doi.org/10.51574/hybrid.v4i2.4163

M.Kep, N. A. S. M., S. Kep, MNS, N. E. S., S. Kep, Sp.Kep.MB, N. A., M. Kep, & M.Kep, N. G. V. S. (2020). Manajemen Cedera Kepala. Ahlimedia Book.

Oktavianus, G. S. (2024, October 10). Pengaruh Latihan Juggling Terhadap Kemampuan Control Bola Pada Siswa Ekstrakurikuler Futsal Di Sma Negeri 1 Sekampung Udik Kabupaten Lampung Timur [Skripsi]. Fakultas Keguruan Dan

Ilmu Pendidikan. https://digilib.unila.ac.id/80719/

Rosmin, R. (2023). Perbedaan Efektivitas Antara Square Stepping Exercise Dengan Otago Exercise Terhadap Peningkatan Kekuatan Otot, Panjang Langkah Dan Keseimbangan Dinamis Pada Penderita Osteoarthritis Knee = Ifferences In Effectiveness Between Square Stepping Exercise And Otago Exercise To Increasing Muscle Strength, Step Length And Dynamic Balance In Knee Osteoarthritis

Patients [Masters, Universitas Hasanuddin]. https://repository.unhas.ac.id/id/eprint/29947/

Srefle, M. (2025). Hubungan Kekuatan Otot Perut Terhadap Teknik Dasar Heading Dalam Permainan Sepak Bola Siswa SMP Negeri Saifi [Diploma, Universitas Pendidikan Muhammadiyah Sorong]. https://eprints.unimudasorong.ac.id/id/eprint/884/

Sucipto. (2023). Mahir Bermain Sepak Bola. Indonesia Emas Group.

Zainuddin, M. S., Usman, A., Kamal, M., Hasanuddin, M. I., & Sufitriyono, S. (2024). Latihan Peningkatan Kecepatan Dalam Bermain Sepakbola Marbo FC. LITERA ABDI: Jurnal Pengabdian Masyarakat, 1(1), 58–68. https://doi.org/10.59734/lajpm.v1i1.12

Zainuddin, M. S., Usman, A., & Zakaria, A. (2025). Optimalisasi Performa Sepak Bola Melalui Latihan Kinestetik Terintegrasi. Indonesian Journal of Physical Activity, 5(2), 214–224. https://doi.org/10.59734/ijpa.v5i2.149