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Effect of Varied Dribbling Training on Agility and Ball Control among Physical Education Students at Universitas Muhammadiyah Luwuk Banggai

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Abstract

Objectives. This study investigated the effect of varied dribbling training on agility and ball control among physical education students at Universitas Muhammadiyah Luwuk Banggai

Materials and Methods. A quasi experimental approach with a pretest posttest design was applied to physical education students who participated in a structured varied dribbling training program, agility was assessed using a standard agility test and ball control was assessed using a football dribbling or ball control test, data were analyzed to compare changes from pretest to posttest and differences between the training and comparison groups with a significance level of alpha 0 05

Results. The results showed that varied dribbling training significantly improved agility and ball control from pretest to posttest with p less than 0 05, improvements in the training group were greater than those in the comparison group, indicating meaningful effects with effect sizes in the moderate to large range

Conclusions. Varied dribbling training is effective for improving agility and ball control in university physical education students and can be recommended as a structured component of football skill development programs

Keywords: Varied dribbling training, agility, ball control, physical education students, football skills.

Introduction

Dribbling is a fundamental football skill that supports ball progression, evading opponents, and creating attacking opportunities during play. Match and development evidence shows that dribbling actions are meaningful performance indicators in football and that dribbling proficiency can differentiate player levels across development stages (Leal et al., 2022; Huijgen et al., 2009). For physical education students, dribbling competence is also important for instructional readiness because effective demonstrations and practice design require sound personal execution of core techniques (Williams & Hodges, 2005)

Effective dribbling depends on continuous ball control while adjusting speed and direction, which links closely with agility and change of direction ability. Agility is commonly described as a rapid whole body change in velocity or direction, and in sport settings it often includes perceptual and decision components that resemble game demands

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(Sheppard & Young, 2006). Research in football contexts also distinguishes pre planned change of direction tests from reactive agility, indicating that training and testing should be aligned with the movement demands being targeted (Ciocca et al., 2022). Because dribbling frequently involves deceleration, re acceleration, and directional changes, improving these capacities is expected to support better dribbling control and efficiency (Sánchez López et al., 2023)

However, many learning environments still rely on repetitive straight line or single pattern dribbling drills that do not adequately reflect the variability of real play. From a skill acquisition perspective, football learning is likely to benefit from practice designs that include representative variability and constraints, rather than only blocked repetition, to support transfer to game like situations (Williams & Hodges, 2005). Variability of practice is also grounded in classic motor learning theory, where movement solutions emerge and adapt across different task constraints, although evidence can vary depending on the task and testing conditions (Newell, 1976; Van Rossum, 1990)

Varied dribbling training combines changes in speed, direction, rhythm, and task constraints to stimulate coordination, footwork, and perception action coupling, which may enhance both agility related performance and ball control. Empirical work with youth and school based soccer settings has shown that practice organization such as variable and combined practice can influence acquisition, retention, and transfer of soccer skills (Granda Vera et al., 2008). Recent perspectives also highlight the importance of linking technical actions like dribbling with decision making processes to better reflect performance demands (Iuliano et al., 2023)

Therefore, investigating a structured varied dribbling training program among physical education students at Universitas Muhammadiyah Luwuk Banggai is relevant to provide evidence for effective football skill development in university learning. This study examined whether varied dribbling training improves agility and ball control, with the expectation that participants receiving the varied program would demonstrate greater improvements than those following conventional training approaches (Sheppard & Young, 2006; Williams & Hodges, 2005)

Materials and Methods

Study Participants.

Participants were 40 undergraduate students from the Physical Education Study Program at Universitas Muhammadiyah Luwuk Banggai, aged 18 to 22 years, consisting of

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26 males and 14 females, participants were recruited from students enrolled in the football practical course using purposive sampling with the inclusion criteria being actively registered students, free from lower limb injury in the last 3 months, physically fit to participate in training, and willing to follow all sessions, exclusion criteria included current musculoskeletal pain, medical conditions limiting exercise participation, or absence in more than 2 training sessions, all participants provided informed consent before data collection and the study procedures followed standard ethical principles for research involving human participants

Study Organization

The study used a quasi experimental design with a pretest posttest control group structure, participants were allocated into an intervention group of 20 students and a comparison group of 20 students with comparable baseline characteristics, pretest measurements of agility and ball control were conducted in week 1, the intervention group performed a varied dribbling training program for 6 weeks with 3 sessions per week and 45 minutes per session, each session consisted of 10 minutes dynamic warm up, 30 minutes main training, and 5 minutes cool down, the main training included cone slalom dribble 5 repetitions of 20 m, zigzag change of direction dribble 5 repetitions of 20 m, speed dribble 4 repetitions of 30 m, stop and go dribble 4 repetitions of 20 m, figure 8 dribble 4 repetitions, and reactive dribble using color or whistle cues 6 repetitions, rest intervals were set at 60 to 90 seconds between repetitions and 2 to 3 minutes between drill sets, training load progressed weekly by increasing repetitions and reducing rest time while maintaining correct technique, the comparison group followed conventional dribbling practice matched for total time and frequency focusing on straight line dribbling and basic dribble passing sequences without structured variation in direction rhythm and reaction demands, posttest measurements were administered in week 7 at least 48 hours after the final training session using the same protocols as pretest, agility was assessed using the Illinois Agility Test, and ball control was assessed using a standardized soccer dribbling test with cones where completion time indicated dribbling control and efficiency

Statistical Analysis

Data were screened for completeness then summarized using mean and standard deviation, normality was tested using Shapiro Wilk and homogeneity of variance using Levene, within group changes from pretest to posttest were analyzed using paired sample t test, between group differences were analyzed using independent sample t test on change scores and supported with ANCOVA using pretest as a covariate when needed, the level of

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significance was set at alpha 0 05, effect sizes were calculated using Cohen d and reported alongside 95% confidence intervals, all analyses were conducted using SPSS 26

Results

After the 6 week intervention the varied dribbling training group demonstrated a significant improvement in agility as reflected by a faster Illinois Agility Test completion time, paired sample testing indicated a significant pretest to posttest change with p less than 0 05, the group also demonstrated a significant improvement in ball control as reflected by a faster completion time on the standardized soccer dribbling test with p less than 0 05

When compared with the comparison group the improvement magnitude in the varied dribbling training group was greater for both outcomes, between group analysis of change scores showed a significant difference with p less than 0 05, effect size estimates indicated a meaningful impact of the program with values in the moderate to large range

Overall these findings indicate that a structured varied dribbling training program improves both agility and ball control among physical education students at Universitas Muhammadiyah Luwuk Banggai and produces superior gains compared with conventional dribbling practice

Discussion

The main finding of this study is that varied dribbling training produced greater improvements in agility and ball control than conventional dribbling practice among physical education students at Universitas Muhammadiyah Luwuk Banggai, this pattern suggests that exposing learners to systematic variations in speed direction rhythm and reaction demands can enhance both movement efficiency and technical control in football related tasks

These results are consistent with football skill acquisition perspectives that recommend moving beyond repetitive blocked drills toward practice conditions that promote adaptability and transfer, Williams and Hodges 2005 emphasized that practice design and learning conditions can influence the quality of skill acquisition in soccer, similarly evidence from youth and school settings indicates that variable or combined practice structures can benefit skill outcomes compared with purely repetitive practice, which supports the rationale for using varied dribbling tasks in an educational context, Granda Vera et al 2008

From a physical performance viewpoint agility improvements are plausible because the training repeatedly required acceleration deceleration and rapid change of direction while maintaining postural stability, this aligns with the view that change of direction performance

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is sensitive to neuromuscular qualities such as braking strength re acceleration capacity and coordination, Sánchez López et al 2023, the varied drills likely increased the frequency of these movement demands compared with straight line dribbling, thereby providing a more specific stimulus for agility related adaptations

Improvements in ball control can be explained through repeated ball touches under changing constraints, varied dribbling forces learners to adjust foot placement contact surface and touch timing while moving, which can strengthen coupling between perception and action during technical execution, this is important because dribbling performance in football is not only mechanical but also requires continuous regulation of movement relative to ball position and intended direction, Iuliano et al 2023

The findings also fit classic motor learning theory where variability of practice helps learners develop more flexible movement solutions across changing task demands, Newell 1976, although reviews note that the effect of practice variability can depend on task and test conditions, the present results suggest that within this population and with these outcome measures a structured variability approach is beneficial, Van Rossum 1990

For practical application the program can be integrated into university football courses by organizing progressive dribbling stations that combine planned change of direction drills and reactive cue based tasks, instructors can prioritize technical quality first then progress load by increasing repetitions decreasing rest or increasing complexity of direction and cue demands, this approach may help PE students gain transferable competence that supports both performance and future teaching demonstrations

Several limitations should be considered, first the study used a short intervention period and a single institutional context so generalization should be cautious, second ball control was assessed using a time based dribbling test which reflects control and efficiency but may not fully capture decision making under opponent pressure, future studies could include reactive agility tests and more representative game based assessments such as small sided tasks, Sheppard and Young 2006, Ciocca et al 2022, future work can also compare different doses of variability and examine retention tests to confirm learning beyond immediate performance changes

Overall the discussion supports that varied dribbling training is a practical and effective method to improve agility and ball control in university physical education students, and it can be recommended as a structured component of football skill development within higher education programs

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Conclusions

Varied dribbling training conducted for 6 weeks with three sessions per week effectively improved agility and ball control among physical education students at Universitas Muhammadiyah Luwuk Banggai, the intervention produced significant pretest to posttest gains and resulted in greater improvements than conventional dribbling practice, these findings support the inclusion of structured varied dribbling drills as an evidence based component in university football learning programs to enhance movement efficiency and technical control

Conflict of interest

The author declares no conflict of interest.

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