



Functional Movement Screen at DKI Jakarta POPB Athletics in 2023

Original Article

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Abstract

Functional Movement Screen (FMS) is a method for assessing a person's functional movement abilities. FMS can be used as a screening and injury prevention effort. The aim of this research is to provide information on weaknesses in functional movement patterns, FMS provides information on asymmetries and limitations in functional movement patterns between right and left and FMS helps predict the risk of injury that may occur. FMS consists of 7 movements, namely: (1) Deep Squat, (2) Hurdle Step, (3) Inline Lunges, (4) Shoulder Mobility, (5) Active Straight Leg Raise, (6) Trunk Stability Push Up, and (7) Rotary Stability. This research is quantitative descriptive. By using observation techniques to collect information. This research involves the use of tools, instruments and procedures to collect objective and systematic data. In this research, the 2023 Jakarta POPB athletics athletes were involved with a total sample of 13 athletes. The results of this research show that the FMS profile of POPB DKI Jakarta athletic athletes in 2023 is 1 athlete showing points 21, namely a perfect score, 7 athletes showing points 17-20, namely good, 3 athletes showing points 14-16, namely inefficient. The average profile of POPB DKI Jakarta athletic athletes in 2023 is in good condition.

Keywords: *functional movement, screening, track and field*

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INTRODUCTION

DKI Jakarta has a Sustainable Achievement Sports Development (POPB) program which was initiated by DISPORA DKI Jakarta since 2019. 37 sports, one of which is athletics, has 39 trained athletes who are trained by experienced and competent coaches. In this case, the trained athletes are under 15 years of age and are students in the DKI Jakarta area.

According to Gray Cook and Lee Burton in (8) FMS is used by many professionals in the fitness and rehabilitation field including physiotherapists, personal trainers, and physical trainers, to assess athletes and non-athletes. The primary goal is to identify and correct imbalances and weaknesses in movement patterns to reduce the risk of injury and increase movement efficiency.

The benefits of FMS are to provide information on weaknesses in functional movement patterns, FMS provides information on asymmetries and limitations in functional movement patterns between right and left and FMS helps predict the risk of injury that may occur. According to Gray Cook and Lee Burton (5) carrying out FMS on young athletes has several important goals, namely:

1. Identify imbalances and weaknesses. FMS helps identify imbalances or weaknesses in movement that may not yet be causing an injury or problem but have the potential to become problems in the future.

2. Injury prevention, by knowing the areas that require improvement coaches and therapists can design specific exercise programs to reduce the risk of injury.
3. Optimizing performance, efficient and symmetrical movement patterns are important for athlete performance. FMS helps in developing training programs that improve an athlete's overall performance.
4. Proper physical development, young athletes are still in their growth and development period. FMS can assist in designing a program that supports healthy growth and ensures that exercise does not place inappropriate stress on a still-developing body.
5. Education and awareness, FMS can educate young athletes about the importance of proper movement and how movement can affect their performance and health.
6. Development monitoring, as a tool for monitoring the development of young athletes, FMS can be used periodically to assess progress and make necessary adjustments to the training program.
7. Communication between training teams, FMS provides a standard framework that can be used to communicate between coaches, therapists, and medical staff about the physical status of athletes.
8. Implementing FMS in young athletes is beneficial for building a strong foundation for efficient and safe athlete movement throughout their careers.

The Functional Movement Screening consists of mobility (human movement tendency), stability and proprioception (motion awareness). Mobility is the range of motion, while stability is related to the joints in the ankle. Proprioception is a human consciousness that directly responds to motion (1).

The FMS examination is carried out to identify any muscle weakness and muscle imbalances through assessing the movements performed. FMS consists of 7 movements, namely: (1) Deep Squat, (2) Hurdle Step, (3) Inline Lunges, (4) Shoulder Mobility, (5) Active Straight Leg Raise, (6) Trunk Stability Push Up, and (7) Rotary Stability. Details of FMS movements are in accordance with guidelines from (3). Therefore, an effort is needed to identify basic functional movements in POPB athletic athletes before moving to the next level. Therefore, researchers want to conduct research on FMS which aims to improve performance, analyze athletes' basic movements, identify imbalances and weaknesses before injury occurs, proper physical development, build a strong foundation and monitor athlete development.

With the development stages, an athlete's career path from childhood to peak performance can also be laid out more clearly, according to the athlete's growth and development. This study aims to identify basic functional movements in POPB athletic athletes using the Functional Movement Screen method. According to (9) the FMS-based test consists of seven tests that are interrelated and have equally important movement patterns. If this test is performed incorrectly, no abnormalities will be detected, and this can further lead to random exercise selection and a lack of solution to the problem. Mobility, strength, flexibility, coordination and balance are essential for successful completion of the test. The first three FMS tests, known as functional movement patterns: deep squat, hurdle step, and incline lunge describe foot placement in three basic positions that people assume during everyday movement. Four other tests, referred to as fundamental movement patterns: active straight leg raising, shoulder mobility, trunk stability, and rotational stability, help clarify the information and show the degree of compensation in the main patterns. In addition, FMS treats the left and right sides of the body separately because incorrect movement patterns can be caused by existing asymmetry and vice versa – asymmetry can be caused by incorrect body posture. FMS checks the basic effects of exercise and movement. Therefore, it is recommended to carry out a rest before starting training preparation or physical activity.

According to Cook (2) in the book the use of fundamental movement as an assessment of function, scores on the FMS range from zero (the poorest score) to three (the best score). Athletes are given a score of zero if they feel pain on the clearing screen test and a score of one if they are unable to complete the FMS movement. A score of two is given if you can complete the FMS

movement with compensatory movements and a score of three if you are able to complete the FMS movement without compensation movements.

The seven FMS tests which will be explained below are shoulder mobility, active straight leg raise, trunk stability push up, rotator stability, deep squat, hurdle step, in-line lunge (3):

1. Shoulder mobility can be used to evaluate the range of motion (ROM) of the shoulder, the ability to combine internal rotation and adduction movements on one arm and a combination of external rotation and abduction movements on the other arm. This test can also be used to evaluate scapular mobility and thoracic spine extension.
2. Active straight leg raise is a test to separate lower extremity muscle activity from the trunk while maintaining stability in the trunk. The active straight leg raise test evaluates flexibility of the gastrocnemius and soleus hamstrings while maintaining the pelvis in a stable position when actively extending the opposite leg.
3. Trunk stability push ups are the ability to stabilize the spine during closed-chain movements in the upper body. This test is useful for evaluating trunk stability and symmetrical movement of the upper extremities.
4. The rotatory stability test is a movement that requires neuromuscular coordination and the transfer of energy from one body segment to another through the trunk. The rotator stability test evaluates trunk stability, symmetrical movement of the upper and lower extremities.
5. Deep squats are a movement required in most athletic sports. Deep squats are used for bilateral evaluation and functional mobility of the hips, knees, and ankles. The dowel held in both hands' functions for bilateral evaluation, symmetrical mobility of the shoulders and thoracic spine.
6. Hurdle step was created to provide a challenge when performing stepping movements. This movement requires stability and proper coordination between the hips and trunk during the lunge movement as well as the stability of standing on one leg. Hurdle step evaluates bilaterally the mobility and functional stability of the hip, knee, and ankle.
7. The ability to perform an in-line lunge requires stability of the standing leg at the ankle, knee, and hip as well as closed kinetic-chain hip abduction. In-line lunges also require step foot mobility in hip abduction, ankle dorsiflexion, rectus femoris flexibility. This test evaluates the mobility and stability of the hip, knee, ankle, and quadriceps flexibility.

MATERIAL AND METHODS

The data collection technique used in this research is observation techniques. Samples undergo a series of tests sequentially in accordance with the test implementation instructions. According to (Sugiyono, 2018) observation is a data collection technique that has specific characteristics when compared with other techniques. The observations in this research were by making direct observations in the field to find out the extent of FMS possessed by POPB athletic athletes.

The scores obtained from the seven tests that have been carried out are added up and then the results of the sum will be the basis for determining FMS in POPB athletic athletes with norms that have been set by Hendra Rustiawan (4) to evaluate a person's basic movement patterns needed to perform daily activities in sports and improve performance).

Score interpretation: (Kiesel, 2006)

1. 21: Perfect score, indicating optimal functional movement and very low risk of injury.
2. 17-20: Good functional movement, but there is some compensation. Low to moderate risk of injury.
3. 14-16: Inefficient functional movements with clear compensation. Moderate to high risk of injury.
4. <14: Poor functional movement with significant compensation and high risk of injury.

General assessment rules according to (Gray Cook, 2015):

1. If an athlete gets a score of zero, then they must be referred to an appropriate medical professional for further evaluation based on a movement-based diagnosis of various functional movement systems.
2. Mobility patterns are addressed first because motor control stability cannot occur when mobility is reduced. Mobility must be restored before stability or motor obstacles are overcome. An appropriate level of mobility ensures that adequate sensory input is used to develop appropriate strategies and an appropriate level of motor control. Without a high level of mobility, stability and quality motor control, motor control cannot and will not be optimal.
3. A score of 21 is not a goal. The goal is to set a baseline and aim to achieve at least 2 of those things every move.

RESULTS

The aim of carrying out this research is to determine the functional movement profile of POPB DKI Jakarta athletic athletes in 2023. This study collected data using 7 FMS test items (deep squat, hurdle step, inline lunge, shoulder mobility, active straight leg raises, trunk stability push-up, rotary stability). Complete data results can be seen in the attachment. The results of data collection using 7 FMS test items on athletes, then researchers carried out analysis using descriptive statistical methods. This research includes calculating minimum, maximum and mean scores. The data is then expressed in percentages which are presented in the form of table (Table 1).

Table 1. Frequency Distribution of FMS Profiles

No	Intervals	Category	Frequency	%
1	21	Perfect	1	08
2	17-20	Good	7	54
3	14-16	Enough	3	23
4	<14	Less	2	15

Based on the research results above, it shows that the Functional Movement Screen Profile of POPB DKI Jakarta Athletics Athletes in 2023 with a frequency of 1 athlete in the perfect category, 7 athletes in the good category, 3 athletes in the fair category, and 2 athletes in the poor category. The FMS Movement Test was created for use in screening fundamental movements, based on the principles of proprioceptive and kinesthetic awareness. Each test is a specific movement that requires appropriate function of the body's kinetic connective system (Soltandoost & Shamsoddini, 2020).

DISCUSSION

Seven FMS items have been carried out on POPB DKI Jakarta athletic athletes in 2023. Carried out independently on the right and left sides of the body. The lowest score contributes to the overall score. According to (6) using targeted items, this examination aims to identify specific movement pattern errors, compensatory movements, lack of mobility or flexibility, lack of movement coordination, and muscle imbalance.

FMS is a useful screening tool to assess functional movement and identify potential risk of injury. FMS assessment norms can help individuals and healthcare professionals to understand movement quality and create appropriate exercise programs to correct inefficient movement patterns. The FMS test movement was created for use in screening fundamental movements, based on the principles of proprioceptive and kinesthetic awareness. Each test is a specific movement that requires appropriate functioning of the body's kinetic connective system. Apart from that, what you need to remember is that motor learning is not only about the body, joints and muscles, but the main thing is to create synergy, balance, symmetry and skills in overall movement patterns.

The seven basic movements in FMS are a combination of upper and lower extremities that accommodate the body's work efficiently. According to Garisson in (8) one of the factors that causes

sports injuries is intrinsic factors, namely the body's biomechanics. With FMS, biomechanical errors in movement when athletes do sports can be detected from the start and the risk of injury can be minimized.

FMS measurements carried out on POPB DKI Jakarta athletic athletes in 2023 were proven to be able to analyze the movements and movement abilities of these athletes. Research (7) shows that there are differences in FMS scores in athletic athletes who have never been injured and those who have a history of injury. This assessment also shows that high FMS values in athletes who have no history of injury also help these athletes avoid injury both during competitions and during training, whereas in athletes who have a history of injury and low FMS values, the incidence rate and risk of re-injury is very high. tall.

This needs to be a consideration for POPB DKI Jakarta athletic trainers to create training programs that are suitable for athletes and train muscles which are basic functional movements for athletic athletes to support athlete achievement and performance. When compared to Kornelius Karus' 2014 research regarding the Efficacy of the Functional Movement Screen: A Review, it is seen that the ability to predict injuries and sports performance is something that is of interest to athletes and coaches. Scientific findings support valid FMS threshold scores for injury risk screening in individual and team sports (6).

Research conducted on POPB DKI Jakarta athletic athletes in 2023 shows that there is a need for the role of coaches and awareness among athletes to train basic functional movements and train the core to improve athlete performance and prevent injury.

CONCLUSION

Based on our knowledge, we as follow:

1. One athlete showed point 21, namely a perfect score, this proves that functional movement is optimal and has a very low risk of injury.
2. Seven athletes showed points 17-20, namely good functional movement, but there is some compensation and the risk of injury that may occur is low to moderate.
3. Three athletes showed points 14-16, in this case the functional movements performed were inefficient, with clear compensation, and the risk of possible injury was moderate to very high.
4. Two athletes showed <14 points, in this case poor functional movement, with significant compensation and high risk of injury.
5. Good FMS influences the progress of POPB athletic athletes' achievements.
6. FMS can identify weaknesses in basic functional movements, apart from that, FMS can also be a guide for developing programs for POPB athletic athletes.
7. FMS in POPB DKI Jakarta athletic athletes is still categorized as good, this is because there are still many athletes who do not realize the importance of awareness of the basic functional movements needed by athletes to prevent future injuries.

Here are several suggestions that can be conveyed, namely:

1. To coaches, strength and conditioning officials, with research on the Functional Movement Screen Profile of POPB DKI Jakarta Athletic Athletes in 2023, it is hoped that coaches, strength and conditioning officials will be able to identify imbalances and weaknesses, carry out appropriate and more targeted physical development, and prevent injuries. At the very least, always monitor athlete development, as well as building basic movements that are strong, efficient and safe for athletes to support progress in performance.
2. To the 2023 POPB DKI Jakarta athletic athletes, with the Functional Movement Screen Profile, it is hoped that athletes will be able to know the extent of basic functional movements possessed by each individual, know the correct movement patterns so that during the training process they do not cause injury, always communicate with trainer if there is pain or pain in performing basic movements. If the basic movements performed are painful or cannot be performed, the athlete must consult with a coach or strength and conditioning official.

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CONFLICTS OF INTEREST

Conflict of interest : Authors state no conflict of interest.

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