

**MOVEMENT PATTERN OF FIELD HOCKEY PLAYERS PLAYING
AT DIFFERENT POSITIONS USING FUNCTIONAL MOVEMENT**

SCREEN: A CROSS-SECTIONAL STUDY

Dissertation Submitted to the

UTKAL UNIVERSITY Bhubaneswar, Odisha

SWEETY GUPTA

In Partial fulfillment of the requirements for the degree of

MASTER OF PHYSIOTHERAPY (M.P.T)

In

SPORTS PHYSIOTHERAPY

Under the guidance of

DR. CHINMAYA KUMAR PATRA

PRINCIPAL



ABHINAV BINDRA SPORTS MEDICINE & RESEARCH INSTITUTE

Bhubaneswar, Odisha 2022-2024



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I hereby declare that this dissertation entitled **“MOVEMENT PATTERN OF FIELD HOCKEY PLAYERS PLAYING AT DIFFERENT POSITIONS USING FUNCTIONAL MOVEMENT SCREEN: A CROSS-SECTIONAL STUDY”** is a bonafide and genuine research work carried out by me under the guidance of DR. Chinmaya Kumar Patra Principal, Abhinav Bindra Sports Medicine and Research Institute, Odisha

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SIGNATURE

Place: Odisha

NAME: Sweety Gupta



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Date:

Signature of Guide:

Place: ODISHA

DR. CHINMAYA KUMAR PATRA

PRINCIPAL

ABSMARI



CERTIFICATE BY THE CO-GUIDE

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Date:

Signature of Co-Guide:

Place: ODISHA

DR. ANAND CHANDRA SAHOO

ASSISTANT PROFESSOR

ABSMARI



ENDORSEMENT BY THE PRINCIPAL

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Date:

Seal & Signature of Principal

Place: ODISHA

Dr. Chinmaya Kumar Patra



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Date:

Signature

Place: Odisha

Name: Sweety Gupta

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LIST OF ABBREVIATIONS

1. **FMS** – Functional Movement Screen
2. **DS** – Deep Squat
3. **HS** – Hurdle Step
4. **ILL**– In-Line Lunge
5. **SM** – Shoulder Mobility
6. **ASLR** – Active Straight Leg Raise
7. **PU** – Push-ups
8. **RS** – Rotatory Stability

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ABSTRACT

MOVEMENT PATTERN OF FIELD HOCKEY PLAYERS PLAYING AT DIFFERENT POSITIONS USING FUNCTIONAL MOVEMENT SCREEN: A CROSS-SECTIONAL STUDY

BACKGROUND: The aim of this study was to evaluate movement patterns of field hockey players by position using the Functional Movement Screen (FMS). The FMS, like other movement screens, identifies movement dysfunction in those at risk of, but not currently experiencing, signs or symptoms of a musculoskeletal injury. Field hockey players' movement patterns vary by position, potentially affecting performance and injury risk.

METHOD: A cross-sectional study assessing 110 elite field hockey players (30 forwards, 30 defenders, 30 midfielders, and 20 goalkeepers) using the FMS. Players' movement patterns were evaluated, and scores were compared across positions.

RESULTS: Significant differences in FMS scores were found between positions ($p < 0.01$). Goalkeepers demonstrated lower scores in the deep squat and in-line lunge tests, while forwards showed higher scores in the ASLR test. Midfielders exhibited better overall movement quality compared to other positions.

Conclusion: This study highlights position-specific movement patterns in field hockey players. Understanding these differences can help coaches and trainers develop targeted training programs to enhance performance and reduce injury risk. Further research should explore the relationship between movement patterns and player performance.

Keywords- Functional movement screen, Field hockey players, movement pattern.

MOVEMENT PATTERN OF FIELD HOCKEY PLAYERS PLAYING AT DIFFERENT POSITIONS USING FUNCTIONAL MOVEMENT SCREEN: A CROSS-SECTIONAL STUDY

INTRODUCTION

Hockey is a famous and successful sport played at Olympic level by men and women worldwide from recreational to Elite level, five continental and 132 national federations are members of the International Hockey Federation. Indian Hockey Federation (IHF) was formed in 1925, following the formation of international Hockey Federation (FIH) ^[1]. Sports training requires the engagement of specific muscle groups with varying intensity in specific positions for an extended period of time. Hockey is a fast and dynamic sport where frequent changes of direction, which need stability and strength of respected muscle groups. Athletes continuously requires walking, running, stepping, jumping movements this leads to challenge their dynamic balance and endurance. Where as the musculoskeletal injuries affect the performance of an athlete. In hockey there are different position, each position had different kind of injuries. Sprains and strains are most common injuries with, forward position (23.3%), midfielders (18.6%), defenders (14%), goalkeeper (6%). Prevalence rate of Overuse injuries are for defenders (7%), forward position (4%), midfielder (2.3%), for ligament injuries (4%), fractures (3%), meniscus injuries (2%) ^[2].

Functional Movement Screen was first proposed by American Orthopedic training experts Gray Cook and Lee Burton, it is derived from famous functional

movement training it was first applied in 1990s. FMS is an excellent, practical screening tool, easily portable, efficient, reliable, easy to practice and execute and can be used in both general community and in sports. Primary goal of FMS is to evaluate the body kinetic chain system as the body is linked system of segments for transferring the forces.

Functional Movement Screen (FMS) is a tool was developed to assess functional performance by identifying restrictions and compensation of movement patterns [3]. It's utilization has increased in recent years, its low cost, simplicity of administration and non-invasive qualities contribute to its use by organizations of professional and amateur athletes, military personals and firefighters. According to Cook the FMS bridges the gap between preparticipation medical examination and performance evaluation by testing the athlete's ability to perform functional multi-segmental movements [4].

In FMS seven subtest are there

1. The deep squat which assess functional mobility of the hips, knees, and ankles.
2. The hurdle step which examines stride mechanics.
3. The in-line lunge which assesses mobility of the hip, trunk, quadriceps flexibility and ankle and knee stability.
4. Shoulder mobility which assesses range of motion and scapular stability.
5. The active straight leg raise which assesses posterior chain flexibility.
6. Push-up which assesses the trunk stability.
7. The rotatory stability test which assesses multi-plane trunk stability.

Each test is given a scoring of 0 to 3, where as the “0” given for pain reported during the Movement, “1” is for failure to complete the movement or loss of balance during the movement, “2” is given for completion of the Movement with compensation, “3” is awarded for performing the movement without any compensation. For each sub-test the scoring given from 0 to 3 respectively ^[4].

Each of the seven functional tests was scored from 0-3 according to the FMS instructions. Both the right and left sides of the body are scored separately, as the participant may score maximum score on one side and lowest score on another side for same test. If any different score was recorded the lower score from both sides can be taken for that particular individual test.

In movement patterns the physical activity, exercise, physical fitness, biomechanics plays a crucial role in understanding the most efficient and effective ways to improve health and wellbeing. Optimal movement patterns aim to understand proper movement patterns and techniques with objective to reduce the risk of injuries and improve exercise efficiency for a better health outcome. Exercise biomechanics constantly deals with strength, stability, and postural alignment. Postural imbalances are usually related to stress on the joints and muscles, leading to pain, discomfort and functional decline. With proper alignment of the joints during exercise is important to reduce the risk of injury and improve physical activities and health. The biomechanical kinetics and kinematics parameters will help with design programs and allow them to increase power and explosiveness, and enhance coordination, reaction time and overall performance.

NEED OF THE STUDY

From the review of literature it has been found that the mechanism of injury varies according to different positions of the players playing in a team sport. This indicates that movement pattern must also be varying at different positions which is assumed to have an important role in sporting performance as well as injury management & prevention. However no study has been found so far on this.

Hence the need of this study arises for better understanding on position specific movement pattern for a team sport.

Since field hockey is a team sport where players at different positions have an important role for the game, this is considered in this study.

AIM OF THE STUDY

To find the movement pattern of field hockey players playing at different positions using FUNCTIONAL MOVEMENT SCREEN.

OBJECTIVES OF THE STUDY

- To evaluate the quality of movement in field hockey players playing at forward position using FMS.
- To evaluate the quality of movement in field hockey players playing at midfield position using FMS.
- To evaluate the quality of movement in field hockey players playing at defending position using FMS.
- To evaluate the quality of movement in field hockey players playing at goalkeeper position using FMS.
- To compare FMS score of all four different positions.

HYPOTHESES

- **NULL HYPOTHESIS** :- There is no significant difference in movement pattern of field hockey players playing at different positions using FMS.
- **ALTERNATIVE HYPOTHESIS** :- There is a significant difference in movement pattern of field hockey players playing at different positions using FMS.

REVIEW OF LITERATURE

- 1) **Nicholas A. Bonazza et al, 2017** conducted a study on reliability, validity, and injury predictive value of the functional movement screen: A systematic review and meta-analysis. Concluded that the FMS has excellent interrater and intrarater reliability. Participants with composite scores of <14 had a significantly higher likelihood of an injury compared with those with higher scores, demonstrating the injury predictive value of the test.
- 2) **Vernetta-Santana.M et al 2019** conducted a study on Movement quality evaluation through the functional movement screen in 12- and 13-year-old secondary school adolescent. Concluded from this research that girls of a sample of students between 12 and 13 years old presented better quality of movement than boys and compensatory exercises would be needed in order to reduce imbalances and asymmetries.
- 3) **Dawid Koźlenia et al 2020** conducted a study on Prediction and injury risk based on movement patterns and flexibility in a 6-month prospective study among physically active adults. Concluded that the risk of an injury increases with low-quality movement patterns, a low level of flexibility, and previous injuries. Preventative strategies should include shaping high-quality movement patterns, the right level of flexibility, and the full healing of injuries before resuming activities.
- 4) **Manaf H et al, 2021** conducted a study on Prevalence and Pattern of Musculoskeletal Injuries Among Malaysian Hockey League Players. Concluded that the prevalence of injury was noticeably high among field

hockey players in Malaysia. The mechanism of injury according to playing positions also varied among each position. The forward position, needing high speed in attempting to shoot a goal; while the defender and the goalkeeper from the opponent team, trying to stop at the same time would subsequently cause a collision and lead to various types of injury.

5) Katie Fitton Davies et al 2022, conducted a study on Association between Functional Movement Screen Scores and Athletic Performance in Adolescents: A Systematic Review they took the studies of Participants aged between 11 and 17 years, studies had to include the Functional Movement Screen, the result of the study is that children and youth who score highly on the FMS also tend to have better scores for agility, running speed, strength, and cardiovascular endurance. Conclusion that there is a relationship between FMS scores and tests of athletic performance in youth.

METHODOLOGY

- STUDY DESIGN: cross-sectional study
- SAMPLING TECHNIQUE: Purposive sampling
- STUDY POPULATION: Field hockey players
- SAMPLING SIZE: 110
- STUDY SETTING: Odisha Naval Tata Hockey HPC
- STUDY DURATION: 10 months

INCLUSION CRITERIA: -

- Age :- 14 to 18 - based on literature support & feasibility
- Player with minimum 2 years of professional training experience.
- Gender - male and female.

EXCLUSION CRITERIA: -

- Those who have history of surgery before 6 months.
- Those who have recent fractures or any musculoskeletal conditions like sprain, strain, subluxation and dislocation in less than 6 months.
- Those who have any other medical, surgical, or psychological condition.

STUDY MATERIALS: -

- FMS kit

OUTCOME MEASURES: -

- Functional Movement Screen (FMS)

ICC value: 0.99 ^[3].

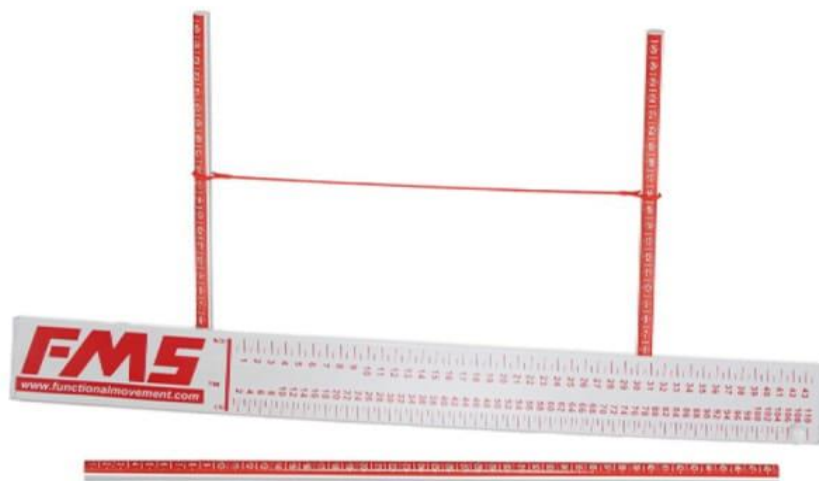


Fig-1- FMS KIT

PROCEDURE

The institutional Ethical committee evaluated and approved the current study. NOC Was taken from the head of Odisha Naval Tata Hockey High Performance Center for the study. Interested players were screened for inclusion and exclusion criteria. Participants were explained about the study in their language. An informed consent form was obtained from the participant's coach and physiotherapist. Each subject completed a short form regarding their injury history and demographic information along with information about the position they played. Each participant's weight was measured in kilograms and height in centimeters. Participants were allocated by purposive sampling method. The participants performed the seven tests (deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability push-up, and rotator stability) 3 times. Each time the participant performed each of the seven tests least they were scored on a scale 0-3. For each of the seven tests, the highest score of the three trials was given to the participant. For the tests with the bilateral assessment component, the side with the lowest score was taken into consideration for total FMS score calculation and was used for data analysis. Three of the tests (shoulder mobility, trunk stability push-up, rotator stability) of FMS have a clearing procedure associated with them.

DEEP SQUAT With your toes pointed forward, position your feet about shoulder-width apart. Maintaining your elbows and shoulders flexed, place your hands on the dowel and hold it overhead. Grind the dowel vertically. With your heels on the ground, your trunk straight, and the dowel as pressed overhead as possible, carefully lower yourself into a squat. Before going back to the beginning position, hold the position for one second.

HURDLE STEP With your feet together, position your toes so they touch the 2x6 board's foundation. Using both hands, place the dowel across the shoulders, just below the neck. Raise your right leg and maintain your posture straight, with your foot in line with your ankle, knee and hip. Keeping your foot in alignment with your ankle, knee, and hip, touch the ground with your heel and step back up to the beginning position.

IN-LINE LUNGE Lay the dowel behind your back so that it touches your sacrum (low back), thoracic spine, and head. The dowel near the cervical spine should be grasped by your right hand. At the lumbar spine, the left hand holds onto the dowel. Put your toe at the beginning position when you take a flat footed step on the 2 by 6 cm board. At the tibialis insertion measurement, position your left heel. The feet need to remain level, with both toes facing forward. To ensure that the dowel touches your head, thoracic spine, and upper gluteus, maintain a straight posture. Reduce to a lunge, bringing the right knee up to the 2x6 board behind the left heel. Get back to where you were before.

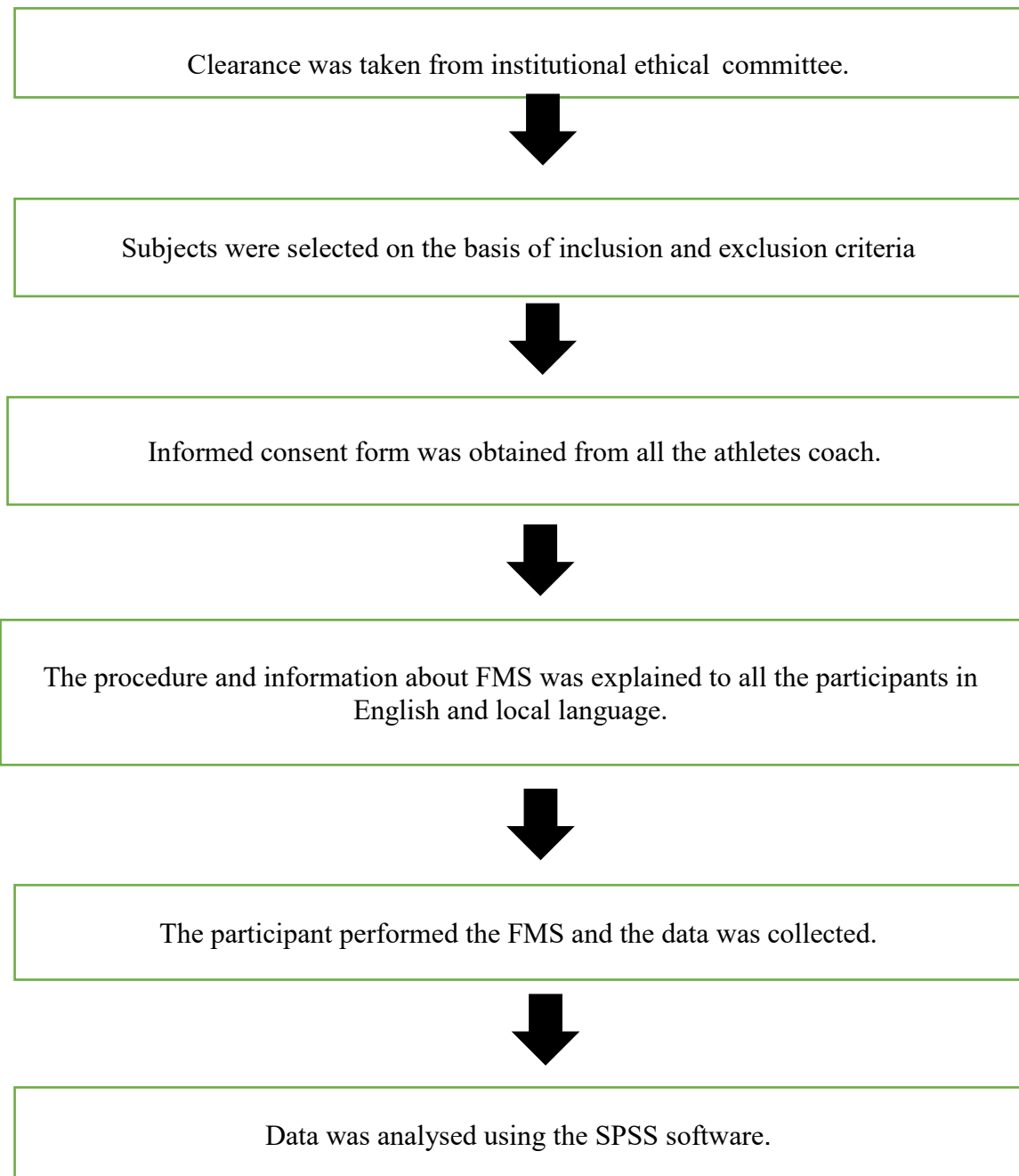
SHOULDER MOBILITY Maintain a relaxed arm position throughout your body while placing your feet together. With each hand, form a fist. One fist should be placed above the head and should be moved as far down your back as feasible. Raise the opposing fist as far along your back as you can at the same time.

ACTIVE STRAIGHT LEG RAISES Position yourself in a supine position, with your toes pointing upward and the back of your knees contacting the 2x6 board. With your hands facing downward, position your arms along your body. Maintaining your knee extended and the back of your knee in touch with the 2x6

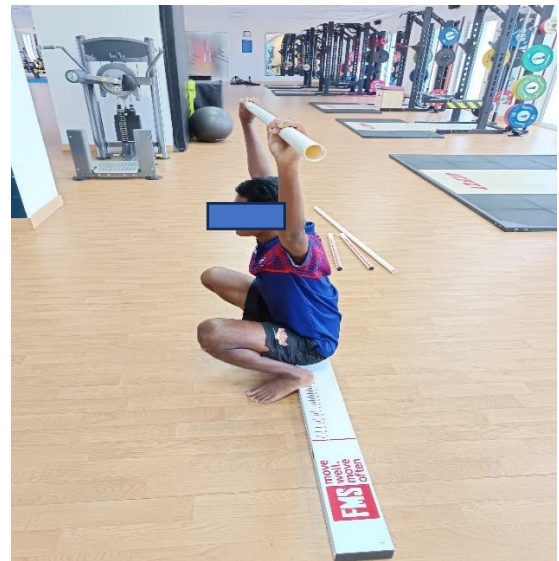
board, raise your right foot's toes towards your shin. Raise your right leg as far as you can.

TRUNK STABILITY PUSH-UP Lie on your back with your hands shoulder-width apart and your arms outstretched. Draw your thumbs down so that they line up with your chin (for girls) or forehead (for boys). Maintaining your legs together, raise your knees and elbows off the floor. Aim to raise your entire body into a push-up position while maintaining a straight trunk.

ROTARY STABILITY Beginning on the 2x6 board, place your hands beneath your shoulders and your knees beneath your hips. The toes need to be facing towards your shins, and your thumbs, knees, and toes need to be in touch with the 2x6 board sides. As though you were flying, simultaneously extend one hand to the front and the opposing leg to the back. Next, over the 2x6 board, contact one elbow with the opposing knee without touching the ground. Take a step back and resume the stretched position. Returning to the starting position.



Flowchart of the study procedure



DEEP SQUAT

Fig-2

Fig-3



HURDEL STEP

Fig-4

Fig-5



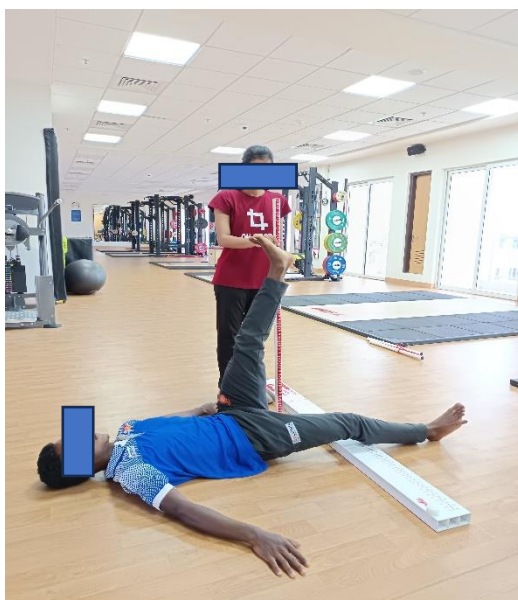
IN-LINE LUNGE

Fig-6



SHOULDER MOBILITY

Fig-7



ASLR

Fig-8



PUSH-UP

Fig-9



Fig-10

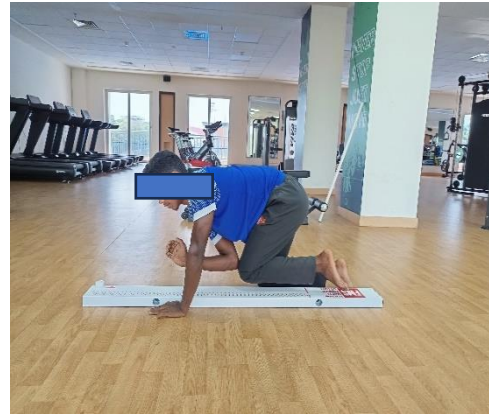


Fig-11

ROTATORY STABILITY

SAMPLE SIZE ESTIMATION

A sample size of 110 subjects was estimated using a medium effect size of 0.5, a power of 0.95, and a level of significance set at 0.05. 110 Participants were included in the study dividing 30 each for forward, midfielder and defender and 20 for goalkeeper.

RESULTS

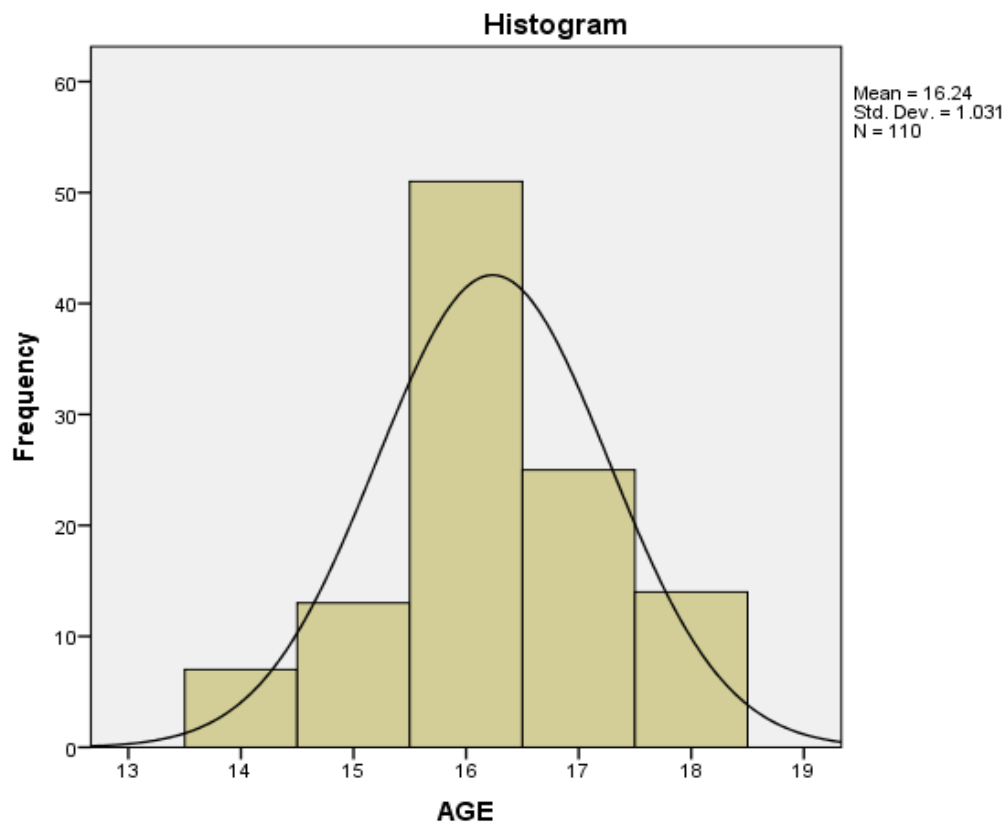
Data was analyzed using the statistical package **SPSS 29.0** . Descriptive statistics was performed to assess the mean and standard deviation. Normality of the data was assessed using **Kolmogorov-smirnov test** where the level of significance was set to $p > 0.05$. **Interferential statistics** to find out difference between groups was done using **INEDEPENDENT T- TEST**. The level of significance was set at $p \leq 0.05$.

ONE WAY ANOVA followed by **Tukey's HSD post hoc analysis** to find out difference between four groups.

	MEAN	SD	RANGE
AGE	16.24	1.031	16.04 – 16.43

Table 1 : Normality of age

The above table shows normality of age which suggest that the data is normally distributed using Kolmogorov-smirnov test.



Graph-1: Normality of age

OUTCOME	GROUPS	MEAN	MEAN DIFFERENCE	P VALUE
FMS	1 VS 2	15.9667 VS 17.2667	1.30	0.027
	1 VS 3	15.9667 VS 15.4333	0.53	0.006
	1 VS 4	15.9667 VS 15.1500	0.81	0.577
	2 VS 3	17.2667 VS 15.4333	1.83	0.567
	2 VS 4	17.2667 VS 15.1500	2.11	0.007
	3 VS 4	15.4333 VS 15.1500	0.28	0.001

Table 2: Between group comparison

The above table shows between group data by using ONE WAY ANOVA.

The result showed that there was statistically significant difference between the group ($p < 0.05$).

OUTCOME	GROUPS	WITHIN P VALUE	F VALUE	MEAN DIFFERENCE
FMS	1 VS 2	0.027	5.143	1.30
	1 VS 3	0.006	8.066	0.53
	1 VS 4	0.578	0.314	0.81
	2 VS 3	0.567	0.331	1.83
	2 VS 4	0.007	7.834	2.11
	3 VS 4	0.01	11.7	0.28

Table 3: within group comparison

The above table shows within the group data by using Independent T test.

Group 1 vs 2 : The result shows significant difference b/w both the groups ($p < 0.05$). The difference in mean values was reported $2 > 1$.

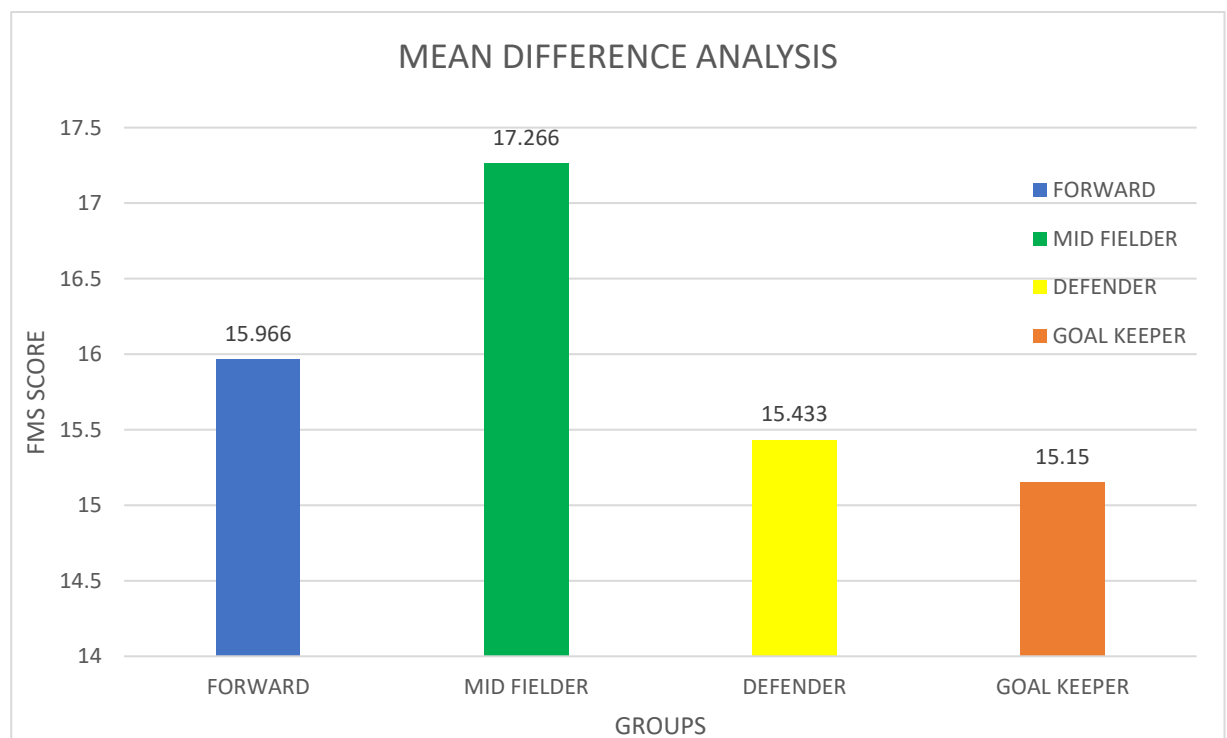
Group 1 vs 3 : The result shows no significant difference b/w both the groups ($p>0.05$). The difference in mean values was reported 1=3.

Group 1 vs 4 : The result shows no significant difference b/w both the groups ($p>0.05$). The difference in mean values was reported 1=4.

Group 2 vs 3 : The result shows significant difference b/w both the groups ($p<0.05$). The difference in mean values was reported 2>3.

Group 2 vs 4 : The result shows significant difference b/w both the groups ($p<0.05$). The difference in mean values was reported 2>4.

Group 3 vs 4 : The result shows no significant difference b/w both the groups ($p>0.05$). The difference in mean values was reported 3=4.



Graph 2: mean difference analysis

DISCUSSION

The current study aimed to find the movement pattern of field hockey players playing at different positions using FMS. Many studies have used the FMS method to evaluate and demonstrate its effectiveness in professional athletes in different sports, but less research has been done for the field hockey players. FMS composite of seven fundamental movement pattern which are used to assess and evaluate an individual's movement quality and functionality. These patterns are deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, push-up, rotary stability. These movement patterns are used to identify movement limitations and asymmetries, evaluate movement quality and functionality. It is also used to develop personalized exercise programs to improve movement patterns and to enhance athletic performance and reduce injury risk. In the current study, we used FMS in four different positions of field hockey players. The composite score for all the seven movements of the FMS was recorded and then compared with other positional player's score. The majority of hockey players (about 70%) were able to get three points from the in-line lunge, shoulder mobility, active straight leg raise. The FMS sub-tests performed with the lowest success rates were rotatory stability and the hurdle step. A lower score in the rotatory stability test is related to shoulder pain ^[12]. Creating suitable workout regimens is crucial to preventing or reducing muscle imbalances in hockey players. A low score among hockey players may be due to a specific asymmetrical position or muscle imbalance, which can cause the tested movements to be performed with compensation ^[12]. Rotatory stability was the movements performed with the lowest success rates by the studied athletes. Due to the complexity of this pattern, appropriate neuromuscular synchronization

and energy transmission across the torso are needed. The test represents the coordinated efforts of mobility and stability. Pelvis, core, and shoulder girdle stability can be evaluated during this test (Cook et al., 2014) ^[13]. The study's aim was judged to be well-defined as there was a significant difference of movement pattern among field hockey players playing at different position. The quality of movements pattern of midfielders were found to be the best as the mean value of FMS score was 17.26, which is the highest score compared to other positions. Midfielders play a central role, connecting defense and offense, requiring them to cover more distance and be involved in both defensive and offensive plays. Midfielders need to be able to move in different directions, speeds, and angles, making their movement patterns more dynamic and unpredictable with increasing movement flexibility. The movement pattern of Forward position was were found to be good as the mean FMS score was 15.69, which is higher than other two positions i.e defenders and the goalkeepers. Forwards have more linear movement as Forwards tend to move more in straight lines, focusing on speed and directness to create scoring opportunities. Forwards often follow established attacking patterns, making their movement more predictable. The defenders mean value FMS score was found to be average as the score was 15.43, which is lower than the midfielders and the forwards. Defenders often prioritize strength, positioning, and timing over speed and agility. Defenders movements are more reactive than proactive. The goalkeeper's movement pattern was found to be below average as they were the least scorer with mean value 15.15 of FMS score. Goalkeepers have most restrictive movement as they are mostly confined to the penalty area. They also have least dynamic movement as Goalkeepers react to shots and passes, making their movement the least

dynamic. From the outcome findings of the study this may be recommended to focus more flexibility training for goal keepers. This might be helpful for them to prevent goals from various directions.

CONCLUSION

The study concludes that Midfielders movement pattern is better than other position players, followed by the forwards, defenders, and least for goalkeepers. Supporting the Alternative Hypothesis of the study. This study highlights position-specific movement patterns in field hockey players. Understanding these differences can help coaches and trainers develop targeted training programs to enhance performance and reduce injury risk.

LIMITATIONS

This study includes hockey players from one center only.

No of participants/ subjects in each group is not uniform.

FUTURE SCOPE

Emphasis may be given to conduct experimental studies in future to observe effect of various flexibility training for goal keepers using Movement Screening Pattern as an outcome measure.

REFERENCES

- 1) Kanchinamala R Patil "Evolution of Field Hockey in India Past and Future : A Study", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.4, Issue 12, page no.238-249, December-2017.
- 2) Manaf H, Justine M, Hassan N. Prevalence and Pattern of Musculoskeletal Injuries Among Malaysian Hockey League Players. Malays Orthop J. 2021 Mar;15(1):21-26.
- 3) Alkhatami K, Alshehre Y, Wang-Price S, Brizzolara K. Reliability and Validity of the Functional Movement Screen™ with a Modified Scoring System for Young Adults with Low Back Pain. Int J Sports Phys Ther. 2021 Jun 1;16(3):620-627.
- 4) Dossa K, Cashman G, Howitt S, West B, Murray N. Can injury in major junior hockey players be predicted by a pre-season functional movement screen - a prospective cohort study. J Can Chiropr Assoc. 2014 Dec;58(4):421-7.
- 5) Fitton Davies K, Sacko RS, Lyons MA, Duncan MJ. Association between Functional Movement Screen Scores and Athletic Performance in Adolescents: A Systematic Review. Sports (Basel). 2022 Feb 22;10(3):28.
- 6) Mercedes Vernetta Santana, María de Orbe-Moreno, Eva María Peláez-Barrios, Jesus López Bedoya Movement quality evaluation through the functional movement screen in 12- and 13-year-old secondary-school adolescents. January 2019 Journal of Human Sport and Exercise 15(4), DOI:10.14198/jhse.2020.154.18.

- 7) Dawid Koźlenia, Jarosław Domaradzki, Prediction and injury risk based on movement patterns and flexibility in a 6-month prospective study among physically active adults, *PeerJ*. 2021; 9: e11399. Published online 2021 May 18. doi: 10.7717/peerj.11399.PMCID: PMC8139277PMID: 34046260
- 8) Bonazza NA, Smuin D, Onks CA, Silvis ML, Dhawan A. Reliability, Validity, and Injury Predictive Value of the Functional Movement Screen: A Systematic Review and Meta-analysis. *Am J Sports Med*. 2017 Mar;45(3):725-732.
- 9) Morencos E, Romero-Moraleda B, Castagna C, Casamichana D. Positional Comparisons in the Impact of Fatigue on Movement Patterns in Hockey. *Int J Sports Physiol Perform*. 2018 Oct 1;13(9):1149-1157. doi: 10.1123/ijsp.2017-0506. Epub 2018 Oct 29. PMID: 29543081.
- 10) Gonçalves BV, Figueira BE, Maças V, Sampaio J. Effect of player position on movement behaviour, physical and physiological performances during an 11-a-side football game. *J Sports Sci*. 2014;32(2):191-9. doi: 10.1080/02640414.2013.816761. Epub 2013 Sep 9. PMID: 24016056.
- 11) Joel Jackson, Gary Snyder, Alex Game, Pierre Gervais, Investigation of Positional Differences in Fitness of Male University Ice Hockey Players and the Frequency, Time Spent and Heart Rate of Movement Patterns during Competition, July 2017 *International Journal of Kinesiology and Sports Science* 5(3):6 DOI:10.7575/aiac.ijkss.v.5n.3p.6.
- 12) Grabara M, Bieniec A. Functional Movement Patterns, Spinal Posture and Prevalence of Musculoskeletal Symptoms among Elite Ice Hockey Players: A Cross Sectional Study. *J Hum Kinet*. 2023 Apr 20;87:59-70. doi: 10.5114/jhk/161548. PMID: 37229409; PMCID: PMC10203833.

13) Cook G, Burton L, Hoogenboom BJ, Voight M. Functional movement screening: the use of fundamental movements as an assessment of function - part 1. Int J Sports Phys Ther. 2014 May;9(3):396-409. PMID: 24944860; PMCID: PMC4060319.

ANNEXURE: 1

CONSENT FORM

I confirm that I have understood about functional movement screen as explained by Miss sweety Gupta and is as mentioned in her study which is taking place under the guidance of Prof. Chinmaya kumar patra, Principal, Abhinav Bindra Sports Medicine and Research Institute(ABSMARI) and co-guidance of Dr. Anand sahu, Ass Professor, ABSMARI. I understand that my participation is voluntary and I'm free to withdraw at any time, without giving any reason. I understand that confidentiality will be maintained. I voluntarily agree to and give my consent to be a part of the above mentioned study.

(signature)

(date)

Ethical Committee Clearance Certificate

**ABSMARI ETHICS COMMITTEE**
ABHINAV BINDRA SPORTS MEDICINE AND RESEARCH INSTITUTE,
BHUBANESWAR, ODISHA

Prof. (Dr.) E. Venkata Rao
Chairperson

Mr. Chinmaya Kumar Patra
Member Secretary

ABSMARI/IEC/2023/059

Ref. No. _____

APPROVAL LETTER
APPENDIX- VIII

Date: **02/09/2023**

To,
Sweety Gupta
ABSMARI
273, PAHAL, BHUBANEWAR-752101

MEMBERS
Dr. Smaraki Mohanty,
Clinician
Dr. Satyajit Mohanty,
Basic Medical Scientist
Dr. Ashok Singh Chouhan
Basic Medical Scientist
Mr. Shib Shankar Mohanty
Legal Expert
Ms. Annie Hans,
Social Scientist
Ms. Subhashree Samal,
Lay Person
Mr. Deepak Ku. Pradhan,
Scientific Member

IEC-SECRETARIAT
Mr. Gouranga Ku. Padhy
Mr. Susant Ku. Raychudamani

Protocol Title: Movement Pattern of Field Hockey Players Playing at Different Positions Using Functional Movement Screen: A Cross-Sectional Study
Protocol ID.: ABS-IEC-2023-PHY-018
Subject: Approval for the conduct of the above referenced study

Dear Mr./Ms./Dr **Sweety Gupta**

With reference to your Submission letter dated 12/08/2023 the ABSMARI IEC has of the Ethics reviewed and discussed your application for conduct of clinical trial on dated 02/09/2023 (Sat Day).

The following documents were reviewed and discussed

S.N.	Documents	Document (Version/Date)
1	IEC Application Form	08-08-2023
2	Informed Consent Form	08-08-2023
3	Undertaking form PI	08-08-2023
4	CRF	08-08-2023
5	COI from the Investigators	08-08-2023

The following members were present at meeting held on 02-09-2023

S.N.	Name of the Member	Designation & Qualification	Representation as per NDCT 2019	Gender (M/F)	Affiliation with the Institution (Y/N)
1	Prof. Dr. E. Venkata Rao	Professor (MBBS, MD, Dept. of Community Med.) IMS & Sum Hospital, BBSR	Chair Person	M	N
2	Dr. Satyajit Mohanty	Director-Medicare Hospital, BBSR	Basic Medical Scientist	M	N
3	Dr. Ashok Singh Chouhan	PhD, Pharmacology, Assoc. Prof. Dept. of Pharmacology, Hi-Tech Medical College & Hospital, BBSR	Basic Medical Scientist	M	N



1

 **Utkal Signature, Plot No.-273,
Ground Floor, Pahal, Bhubaneswar-752101**

 **+91-63707-03654**

 **iec@absmari.com**



ABSMARI ETHICS COMMITTEE

ABHINAV BINDRA SPORTS MEDICINE AND RESEARCH INSTITUTE,
BHUBANESWAR, ODISHA

Prof. (Dr.) E. Venkata Rao
Chairperson

Mr. Chinmaya Kumar Patra
Member Secretary

Ref. No. ABSMARI/IEC/2023/059

Date 02/09/2023

MEMBERS

Dr. Smaraki Mohanty,
Clinician

Dr. Satyajit Mohanty,
Basic Medical Scientist

Dr. Ashok Singh Chouhan
Basic Medical Scientist

Mr. Shib Shankar Mohanty
Legal Expert

Ms. Annie Hans,
Social Scientist

Ms. Subhashree Samal,
Lay Person

Mr. Deepak Ku. Pradhan,
Scientific Member

IEC-SECRETARIAT

Mr. Gouranga Ku. Padhy
Mr. Susant Ku. Raychudamani

S.N.	Name of the Member	Designation & Qualification	Representation as per NDCT 2019	Gender (M/F)	Affiliation with the Institution (Y/N)
4	Dr. Smaraki Mohanty	Asst. Prof-IMS & Sum Hospital/MBBS, MD (Community Med)	Clinician	F	N
5	Mr. Chinmaya Kumar Patra	Principal-ABSMARI, MPT	Member Secretary	M	Y
6	Mr. Shiba Sankar Mohanty	Junior Counsel-Lt. Ramachandra Sorangi's Chamber / BA LLB	Legal Expert	M	N
7	Ms. Annie Hans	Disability Inclusive Development Co-Ordinator in Humanity and Inclusion (India/Nepal/Srilanka). /MA in Social Work	Social Scientist	F	N
8	Ms. Subhashree Samal	Ref. Reader-Pol Sc.	Lay Person	F	N
9	Mr. Deepak Kumar Pradhan	Asst. Prof-ABSMARI, MPT	Scientific Member	M	Y

This is to confirm that only members who are independent of the Investigator and the Sponsor of the trial have voted/ provided opinion on the trial.

This Committee approves the documents and the conduct for the trial in the presented form with necessary recommendation.

The ABSMARI IEC must be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and requests to be provided a copy of the final report.

The ABSMARI IEC follows procedures that are in compliance with the requirements of ICH (International Conference on Harmonization) guidance related to GCP (Good Clinical Practice) and applicable Indian regulations.

Yours sincerely,

Mr. Chinmaya Kumar Patra
Member Secretary

ABSMARI Ethics Committee

Pahal, Bhubaneswar

Member Secretary

ABSMARI ETHICS COMMITTEE



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Utkal Signature, Plot No.-273,
Ground Floor, Pahal, Bhubaneswar-752101



+91-63707-03654



iec@absmari.com

ANNEXURE: 2

ASSESSMENT FORM

FMS

THE FUNCTIONAL MOVEMENT SCREEN

SCORING SHEET

NAME	DATE	DOB
ADDRESS		
CITY, STATE, ZIP	PHONE	
SCHOOL/AFFILIATION		
SSN	HEIGHT	WEIGHT
AGE	GENDER	
PRIMARY SPORT	PRIMARY POSITION	
HAND/LEG DOMINANCE	PREVIOUS TEST SCORE	

TEST	RAW SCORE	FINAL SCORE	COMMENTS
DEEP SQUAT			
HURDLE STEP	L		
	R		
INLINE LUNGE	L		
	R		
SHOULDER MOBILITY	L		
	R		
IMPINGEMENT CLEARING TEST	L		
	R		
ACTIVE STRAIGHT-LEG RAISE	L		
	R		
TRUNK STABILITY PUSHUP			
PRESS-UP CLEARING TEST			
ROTARY STABILITY	L		
	R		
POSTERIOR ROCKING CLEARING TEST			
TOTAL			

Raw Score: This score is used to denote right and left side scoring. The right and left sides are scored in five of the seven tests and both are documented in this space.

Final Score: This score is used to denote the overall score for the test. The lowest score for the raw score (each side) is carried over to give a final score for the test. A person who scores a three on the right and a two on the left would receive a final score of two. The final score is then summarized and used as a total score.

ANNEXURE: 3

MASTER CHART

S. NO	NAME	AGE/SEX	POSITION	DEEP SQUA T	HURDEL STEP		INLINE LAUNGE		SHOULDER MOB		ASLR		PUSH UP	ROT. STAB		TOTAL SCORE
					Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt		Rt	Lt	
1	Suraj kua. Sahoo	16/M	Forward	3	3	3	3	3	3	3	3	3	2	2	2	19
2	Tazhu	15/M	Forward	3	2	3	2	2	3	3	3	3	3	2	2	18
3	Rohan akka	15/M	Forward	2	2	2	2	2	3	3	2	2	2	2	2	15
4	Anil	15/M	Midfielder	3	3	3	3	3	3	3	3	3	2	2	2	19
5	Sagar	16/M	Forward	2	2	2	3	3	2	2	2	2	3	2	2	16
6	Bishal kaitha	16/M	Midfielder	2	3	3	1	2	3	2	3	3	3	2	2	17
7	Santosh sonar	16/M	Goal keeper	2	2	2	3	3	2	1	2	2	2	2	2	14
8	Mongal saho	15/M	Goal keeper	2	3	3	2	3	1	1	2	2	1	2	1	12
9	Sadep lakra	15/M	Defender	3	2	1	2	3	3	3	3	3	2	3	2	17
10	Nitesh Miz	16/M	Defender	0	3	2	3	3	3	3	3	3	3	2	2	16
11	Alok kujar	16/M	Forward	3	2	1	2	2	3	3	3	3	3	2	2	17
12	Ashish kua. Toppo	15/M	Midfielder	3	2	3	3	3	3	2	3	3	3	2	2	18
13	Abhishek toppo	16/M	Defender	3	3	2	3	2	3	2	3	2	3	1	1	15
14	Sanjit thiray	18/M	Defender	3	3	3	3	3	3	2	1	1	3	2	1	16
15	Arbin toppo	18/M	Midfielder	3	2	3	3	3	2	2	3	3	3	2	2	18
16	Aryan wass	18/M	Forward	2	2	3	3	3	3	3	2	2	2	2	2	16
17	I. Rohit Singh	17/M	Forward	0	1	1	0	0	2	1	3	3	3	2	2	10
18	Heman akka	16/M	Midfielder	2	2	2	3	3	3	3	3	3	3	2	2	18
19	Harish leitanthem	17/M	Forward	2	3	3	3	3	3	3	3	3	3	2	2	19
20	Jasman munda	16/M	Defender	3	3	3	2	2	2	2	3	3	3	2	2	18
21	Nishant kujar	14/M	Forward	2	2	2	3	3	2	2	2	2	2	2	1	15
22	Prem Dayal giri	17/M	Midfielder	2	3	3	3	3	2	2	3	3	2	2	2	17
23	Pradip mandal	17/M	Defender	2	3	3	3	2	3	2	3	3	3	3	2	17
24	Rohit kulu	16/M	Midfielder	2	3	3	3	3	2	2	3	2	2	2	2	16
25	Pritam akka	17/	Forward	2	3	3	3	3	2	1	2	3	3	3	3	17
26	Naothomba puhramba	15/M	Defender	2	2	3	2	1	3	2	3	3	1	3	3	14
27	Suresh Sharma	16/M	Midfielder	3	3	3	3	3	2	2	3	3	3	2	2	19
28	Sadarsan goud	16/M	Defender	1	3	2	2	3	3	2	2	2	3	2	2	14
29	Ganesh	17/M	Goal keeper	2	3	2	3	3	3	3	3	3	2	2	2	17
30	Ronit rai saxa	16/M	Goal keeper	2	3	3	3	2	2	1	1	1	3	2	2	14
31	Sandeep akka	17/M	Defender	2	2	2	1	2	3	3	3	3	2	3	3	16
32	Yojin miz	16/M	Forward	2	3	2	3	2	2	1	3	3	3	2	2	15
33	Bidyandana singh	16/M	Forward	2	3	2	2	2	2	2	3	3	2	2	2	15
34	Vivek lakra	16/M	Goal keeper	2	3	2	2	2	3	3	3	3	2	2	2	16
35	Ajay saxa	16/M	Defender	2	1	1	3	3	2	1	3	3	3	2	3	15
36	Wilson saxa	18/M	Defender	3	2	3	3	3	3	3	3	3	2	3	2	18
37	Pratap toppo	18/M	Forward	3	3	3	3	3	3	2	3	3	2	2	2	18
38	Samir barua	16/M	Midfielder	3	3	3	3	3	3	2	3	3	3	2	2	19
39	Karan lakra	17/M	Forward	2	3	2	3	3	3	1	3	3	3	2	2	16
40	Bibhan oram	16/M	Defender	2	1	1	1	2	3	3	3	3	3	2	2	15
41	Abhimanu goud	16/M	Goal keeper	1	2	1	2	3	3	2	3	3	2	2	2	12
42	Anmol kulu	16/M	Defender	2	3	3	2	3	2	2	2	2	3	2	2	16
43	Deepak pradhan	16/M	Forward	2	1	1	3	3	3	2	3	2	2	2	2	14
44	Saadbin lagun	14/M	Defender	2	3	3	2	1	3	3	2	2	1	2	2	14
45	Sachin kindo	17/M	Midfielder	1	3	2	2	3	3	3	3	3	3	2	1	15
46	Liona lakra	15/F	Forward	1	3	3	3	3	3	2	2	2	1	2	1	13
47	Saumitha dung dung	16/F	Defender	1	3	3	3	3	3	2	2	2	3	2	2	15
48	Sargana Sarita kertetta	16/F	Midfielder	2	2	2	2	3	2	1	3	3	2	2	2	14
49	Olivia saxa	17/F	Defender	2	2	3	3	2	3	2	3	3	3	2	2	16
50	Kanika ierketta	16/F	Midfielder	2	3	2	3	3	2	2	3	3	3	1	2	16
51	Anjana barla	16/F	Defender	1	2	2	3	3	3	2	3	2	3	2	2	15
52	Premila	16/F	Midfielder	2	3	3	3	3	3	3	3	3	3	2	2	19
53	Chetna Rani das	17/F	Forward	1	2	3	2	2	2	2	3	3	2	2	2	14
54	Komal gunjar	18/F	Forward	3	2	3	3	3	3	3	2	2	1	2	2	15
55	Sheetal yadav	14/F	Forward	1	2	2	2	3	2	1	2	2	3	2	2	13
56	Priyanka toppo	17/F	Midfielder	2	1	2	3	3	3	3	3	3	3	2	2	17
57	Molisha verma	17/F	Midfielder	1	2	2	3	3	3	3	3	3	3	2	2	17
58	S. Chanu	16/F	Goal keeper	1	2	2	3	3	3	3	2	2	3	2	2	16
59	Dolly bhoi	16/F	Forward	2	1	1	3	3	3	3	3	3	3	2	2	17
60	Srutika kulu	16/F	Defender	1	3	2	3	3	2	3	3	3	3	2	2	16
61	Pooja ramchhuria	17/F	Defender	1	3	2	3	3	3	3	3	3	3	3	2	17
62	Namsi janka	18/F	Goal keeper	2	3	3	3	3	3	3	3	3	3	2	3	19
63	Neharika	15/F	Defender	2	3	2	2	1	3	3	3	3	3	2	2	13
64	Joshna teta	18/F	Defender	1	1	1	3	2	3	2	3	3	3	2	2	14
65	Anandita toppo	17/F	Forward	3	2	1	3	3	2	2	1	2	2	2	2	14
66	Pragna patel	14/F	Forward	3	3	3	3	3	3	2	3	3	3	2	2	19
67	Surekha bahala	17/F	Forward	3	3	2	2	2	2	2	3	3	3	3	3	18
68	Yoshoda meravi	16/F	Forward	2	3	3	3	3	3	3	3	3	2	3	3	18
69	Sona yadav	14/F	Forward	1	2	2	2	3	2	1	2	2	3	2	2	13
70	Dimpy bhoi	16/F	Forward	2	1	1	3	3	3	3	3	3	3	3	2	17
71	Anita singh	17/F	Forward	3	2	1	3	3	2	2	1	2	2	2	2	14
72	Neha kindo	14/F	Forward	3	3	3	3	3	3	2	3	3	3	3	2	19
73	Subhasmita akka	17/F	Forward	3	3	2	2	2	2	2	3	3	3	2	2	17
74	Manju oram	16/F	Forward	2	3	3	3	3	3	3	3	3	2	3	2	18
75	Ayush	15/M	Midfielder	3	3	3	3	3	3	3	3	3	2	2	2	19
76	Simran saxa	16/M	Midfielder	2	3	3	1	2	3	2	3	3	3	2	2	17
77	Akash toppo	15/M	Midfielder	3	2	3	3	3	3	2	3	3	3	2	2	18

78	Aryan toppo	18/M	Midfielder	3	2	3	3	3	2	2	3	3	3	2	2	18
79	Hitesh akka	16/M	Midfielder	2	2	2	3	3	3	3	3	3	3	2	2	18
80	Piyush giri	17/M	Midfielder	2	3	3	3	3	2	2	3	3	2	2	2	17
81	Ronit kulu	16/M	Midfielder	2	3	3	3	3	2	2	3	2	2	2	2	16
82	Salmon kindo	16/M	Midfielder	3	3	3	3	3	2	2	3	3	2	2	2	19
83	Krishna pradhan	16/M	Midfielder	3	3	3	3	3	3	2	3	3	3	2	2	19
84	Shivam kindo	17/M	Midfielder	1	3	2	2	3	3	3	3	3	3	2	1	15
85	Sonali rout	16/F	Midfielder	2	2	2	2	3	2	1	3	3	2	2	2	14
86	Seema akka	16/F	Midfielder	2	3	2	3	3	2	2	3	3	3	1	2	16
87	Arti lojur	16/F	Midfielder	2	3	3	3	3	3	3	3	3	3	2	2	19
88	Ankita toppo	17/F	Midfielder	2	1	2	3	3	3	3	3	3	3	2	2	17
89	Priti tirkey	17/F	Midfielder	1	2	2	3	3	3	3	3	3	3	2	2	17
90	Ankit topo	16/M	Goal keeper	2	2	2	3	3	2	1	2	2	2	2	2	14
91	Biksal munda	15/M	Goal keeper	2	3	3	2	3	1	1	2	2	1	2	1	12
92	B malaya reddy	17/M	Goal keeper	2	3	2	3	3	3	3	3	3	2	2	2	17
93	Hiramani munda	16/M	Goal keeper	2	3	3	3	2	2	1	1	1	3	2	2	14
94	P swarup reddy	16/M	Goal keeper	2	3	2	2	2	3	3	3	3	2	2	2	16
95	Subham akka	16/M	Goal keeper	1	2	1	2	3	3	2	3	3	2	2	2	12
96	Sapna chana	16/F	Goal keeper	1	2	2	3	3	3	3	2	2	3	2	2	16
97	Bandana soren	18/F	Goal keeper	2	3	3	3	3	3	3	3	3	3	2	3	19
98	Vishal lakra	16/M	Goal keeper	2	3	2	2	2	3	3	3	3	2	2	2	16
99	Deepak barla	16/M	Goal keeper	1	2	1	2	3	3	2	3	3	2	2	2	12
100	Swerla baddik	16/F	Goal keeper	1	2	2	3	3	3	3	2	2	3	2	2	16
101	Boby gram	18/F	Goal keeper	2	3	3	3	3	3	3	3	3	3	2	3	19
102	Atish minz	16/M	Defender	2	3	3	2	3	2	2	2	2	3	2	2	16
103	Ayush dung dung	14/M	Defender	2	3	3	2	1	3	3	2	2	1	2	2	14
104	Vandana dungdung	16/F	Defender	1	3	3	3	3	3	2	2	2	3	2	2	15
105	Ananya xaxa	17/F	Defender	2	2	3	3	2	3	2	3	3	3	2	2	16
106	Nandini soronia	16/F	Defender	1	2	2	3	3	3	2	3	2	3	2	2	15
107	Sruti xaxa	16/F	Defender	1	3	2	3	3	2	3	3	3	3	2	2	16
108	Puja punia	17/F	Defender	1	3	2	3	3	3	3	3	3	3	3	2	17
109	Geeta rout	15/F	Defender	2	3	2	2	1	3	3	3	3	3	2	2	13
110	Jaya bhoi	18/F	Defender	1	1	1	3	2	3	2	3	3	3	2	2	14