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Evaluation of the proficiency barrier for injury and its associated with psychometric qualities among recreational cricket players

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Abstract
The Functional Movement Screening is an assessment of an individual's movement quality that has been utilized to evaluate risk of injury in recreational cricket player and minimal support regarding the predictive value of the screen recreational cricket player and to find out association between Proficiency Barrier for Injury and Psychometric Qualities among Recreational Cricket Player. Cross-sectional study conducted with 120 Recreational Cricket players who had participated in different Cricket academy Ahmedabad. Assessment was done according to the proforma. Overall, the individual scores from recreational cricket a player was between 2 or 3 per task. Mild positive association the proficiency barrier for injury and psychometric qualities among recreational cricket player($r = 0.253$, $p<0.005$).FMS score of 18 is the gold standard for assessing risks of injury in all populations; this study has suggested that the good FMS cut score for assessing the risk of sport injury in recreational cricket players.

Keywords: Injury, psychometric qualities, recreational cricket player

Introduction
Cricket is popular throughout the world with 104 countries or geographical areas registered in the International Cricket Council. However, cricket has a high injury rate. Cricket injuries have been reported to be as high as 53 injuries per 10,000 athlete exposures, with injury prevalence differing per playing position. Different injury rates based on playing position may be related to contrasting psychological and biomechanical demands [1].

Pre-participation and pre-season athletic screening procedures are well established components of international sport programs, and are utilized to identify potential risk factors that might lead to injury and illness such as cardiac disease, head injury, and specific musculoskeletal problems [2]. Recently, researchers have utilized movement examinations that involve comprehensive movement patterns to predict injury. Pilsky *et al* hypothesized that tests assessing multiple domains of function (balance, strength, range of motion) simultaneously may improve the accuracy of identifying athletes at risk for injury through pre-participation assessment. The Functional Movement Screen (FMS) is a comprehensive exam that assesses quality of fundamental movement patterns to identify an individual's limitations or asymmetries [3].

Psychometric qualities is frequently used as an outcome measure that evaluates the quality of care, while the Short Form-36 (SF-36) and RAND-36 is a reliable tool that provides good reliability and validity for assessing the individuals' quality of life in different stages of an illness [4]. High fees have to be paid for, using and scoring the SF-36, and the high cost of the instrument can make its use unfeasible, particularly for users from developing countries [5]. The RAND-36 scoring and use are publicly available on the RAND Corporation web site. The original Ware-36, published in 1992, and the RAND-36, is composed by thirty-six identical items, and both instruments have been referred to as the "SF-36" [6].

The Functional Movement Screening is an assessment of an individual's movement quality that has been utilized to evaluate risk of injury in recreational cricket player. However, there is minimal support regarding the predictive value of the screen recreational cricket player. The purpose of this study to evaluate the existence of a composite FMS score proficiency barrier to

predict injury risk and find out association between Proficiency Barrier for Injury and Psychometric Qualities among Recreational Cricket Player.

Materials and Methods

Observational analytical study conducted at different Cricket academy of Ahmedabad with purposive sampling. Study duration was August 2023 to December 2023. A sample size was estimated on the basis of pilot study and the sample size obtained was 120. N= {Zα+Zβ) / C^2}, Where; C =0.5 × in {(1+r)/ (1-r)} r=correlation coefficient

Age 8-18 years old, Girl & boy, with minimum of 8-10 hours practice per week, having played a cricket ≥ 2 years were included in present study. History of any surgery in the last 3 months, any injury in last month's due to not performed functional screening test, history of pain in any regions interfering with sport participation within 6 months, history of neurological, musculoskeletal, cardio respiratory disorders and diagnosis with any psychometric disorders were excluded in present study. The study was conducted according to the ethical principles of the Declaration of Helsinki and there was no risk to the participant. Total 158 recreational cricket player individuals were screened, out of which 27 individuals did not match the inclusion criteria and 11 were not interested in this study. It is a cross-sectional study conducted with 120 Recreational Cricket players who had participated in different Cricket academy Ahmedabad, India. Convenience sampling was adopted for the selection of individuals for the study. Individual's players and those parents were explained about the study. Consent was taken from those willing to participate and fulfilling inclusion and exclusion criteria were included in the study. Written informed consent was taken from parents. Assessment was done according to the proforma. Each subject was given appropriate rest period between all tests.

Functional movement screening

A fundamental movement pattern is a basic movement utilized to simultaneously test range of motion, stability, and balance. The exam requires muscle strength, flexibility, range of motion, coordination, balance, and proprioception in order to successfully complete seven fundamental movement patterns [7]. The seven tests utilize a variety of basic positions and movements which are thought to provide the foundation for more complex athletic movements to be performed efficiently. The seven tests are: 1) the deep squat which assesses bilateral, symmetrical, and functional mobility of the hips, knees and ankles, 2) the hurdle step which examines the body's stride mechanics during the asymmetrical pattern of a stepping motion, 3) the in-line lunge which assesses hip and trunk mobility and stability, quadriceps flexibility, and ankle and knee stability, 4) shoulder mobility which assesses bilateral shoulder range of motion, scapular mobility, and thoracic spine extension, 5) the active straight leg raise which determines active hamstring and gastro-soleus flexibility while maintaining a stable pelvis, 6) the trunk stability push-up which examines trunk stability while a symmetrical upper-extremity motion is performed, and 7) the rotary stability test which assesses multi-plane trunk stability while the upper and lower extremities are in combined motion [8].

The athlete is scored from zero to 3 on each of the seven movement patterns with a score of 3 considered normal. The scores from the seven movement patterns are summed and a composite score is obtained. The intra-rater reliability of the composite score for the FMS is reported to have an ICC value of 0.98 [9].

RAND 36 item health survey: The RAND-36 is a 36-item questionnaire which generates eight health-related quality of life domains: physical functioning (10 items), role limitations due to physical health (four items), role limitations due to emotional problems (three items), energy/fatigue (four items), emotional well-being (five items), social functioning (two items), bodily pain (two items), and general health (five items) [10]. A single item indicates individual self-perceived change in health. There are some differences between the Ware-36 and RAND-36 scoring methods. Both questionnaires use the same 36-six items and answer choices, obtaining identical results in six of the eight domains, but they differ in the bodily pain and general health domains [11]. The RAND-36 domains are scored on a 0 to 100 range, so that a high score defines a more favorable health-related quality of life [12].

Statistical Analysis

Data analysis was done using SPSS version 20 and Microsoft excel 2019. In this study, two outcome measures were taken, one is Proficiency Barrier for Injury which is quantitative in nature, measured by functional movement screening and second one is measure of psychometric qualities, measured by RAND 36 survey which is qualitative in nature.

Evaluating the Proficiency Barrier for Injury functional movement screening (FMS)

Done by Microsoft excel 2019. Prior to statistical tests, the data was screened for normality. As the sample size was more than 50 in Kolmogorov-Smirnov test (KS test) used to check normality. Data of all the outcomes were not normally distributed. Association Proficiency Barrier for Injury and psychometric qualities using FMS and RAND 36 survey were done by non – parametric test – spearman's correlation. Level of significance was kept at 5% (p<0.05).

Results

The present study was conducted evaluating the proficiency barrier for injury among recreational cricket player. Proficiency barrier for injury associated with psychometric qualities among recreational cricket player in Ahmadabad city. Total 120 participants, completed the study. The mean age of participants was 13.83± 2.90 years. In present study 88% boy and 12% girl participated in present study. Table 1 shows the functional movement screening scores among recreational cricket players. Table 2 shows association of functional movement screening with Psychometric Qualities among Recreational Cricket Player.

Functional movement screening

Table 1: Mean ± SD for Functional movement screening among recreational cricket players

Screening Test	MEAN ± SD
Deep squat	2.95±0.22
Hurdle step	2.83±0.38
In line lunge	2.68±0.52
Shoulder mobility	2.73±0.48
Active straight leg raise	2.63±0.50
Trunk stability push up	2.61±0.74
Rotary stability	2.47±0.62
Total FMS score	18.86±2.11

Association of functional movement screening with Psychometric Qualities among Recreational Cricket Player

Table 2: Association in FMS & RAND 36 SURVEY

Outcome measures	Spearman correlation coefficient (r - value)	p – value
FMS and RAND 36 SURVEY	0.253	<0.005

Discussion

In present study overall, the individual scores from recreational cricket a player was between 2 or 3 per task. Thus, it is clear these youth participants demonstrate compensated movement patterns as evaluated by the FMS. Improved functional motor competence may have a protective effect on future injury incidence because motor competence is associated with multiple aspects of physical fitness (e.g., muscular strength, power, endurance and cardiovascular endurance) in youth, which is linked to injury risk. Contrast to present study. Dorrel B *et al* found that FMS did not provide discriminatory prediction of musculoskeletal injury, overall injury, or severe injury in National Collegiate Athletic Association Division II athletes. Using the identified optimal cut score produced inadequate validity, regardless of the injury definition. We recommend using the FMS to assess movement quality rather than as a standalone injury-prediction tool until additional research suggests otherwise [13].

In present study mild positive association the proficiency barrier for injury and psychometric qualities among recreational cricket player (r = 0.253, p<0.005). Pfeifer CE *et al* found that functional screening correlated with the quality of life among professional athletes [14]. Tranaeus U *et al* found that the combination of more frequent use of the coping strategy of positive reframing and high levels of physical performance capacity may prevent a traumatic injury in adolescent female footballers. Coaches are encouraged to adopt both physiological and psychological factors when preventing injuries in young female footballers [15].

Limitation of present study: Medical condition, Body mass index was not taken. Multivariate analysis between age, gender, all screening test and psychometric qualities were not done.

Conclusion

In conclusion, a FMS score of 18 is the gold standard for assessing risks of injury in all populations; this study has suggested that the good FMS cut score for assessing the risk of sport injury in recreational cricket players. Consideration of an individual's movement within the context of their sport is necessary, as each recreational player. Addressing movement dysfunction may aid in injury reduction and potentially improve sport performance.

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