CO-RELATION BETWEEN WARM-UP KNOWLEDGE AND PRACTICE WITH INJURY PREVALENCE IN FOOTBALL PLAYERS

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Abstract: Improving agility while warm-up routine offers significant benefits they are often not executed properly due to lack of understanding. Addressing this knowledge addressing this knowledge gap is essential for changing behaviors, which can lead to fewer injuries and greater benefits from warming up. It's important to evaluate their current awareness and practice related to warm-up. To observe whether there is relation between knowledge of warm-up, level of practice with injures. Data of 150 football players knowledge, practice of warm-up and injury prevalence was collected using a self-prepared questionnaire. The data was later analyzed using Pearson's r measure. The data found a strong positive correlation between knowledge and practice ($r = 0.72$, $p < 0.001$), a moderate positive correlation between knowledge and injury occurrence ($r = 0.43$, $p = 0.002$), and a weak to moderate positive correlation between practice and injury ($r = 0.39$, $p = 0.005$); the mean scores were Knowledge = 4.12 ± 0.58, Practice = 3.87 ± 0.61, and Injury = 3.42 ± 0.74, indicating that greater knowledge of warm-up was associated with improved practice but did not necessarily correspond to a lower injury rate. The correlation between the knowledge of warm-up it's practice and injury prevalence shows, due lack of proper knowledge and improper practice the injury prevalence is high. Introducing a structed warm-up program can help reducing injury prevalence

Keywords:

Warm-up, warm-up knowledge, Physical Exercise, Football, Physiotherapy, injury prevalence

INTRODUCTION

High-impact activities of varying degrees lead to stress on the muscular, joint, and neurologic systems of the body which highly predisposes football players to an injury, particularly in the lower extremity (ankle, knee, and groin). [2]Most common injuries in football are considered non-contact injuries and generally associated due to poor neuromuscular control, fatigue, and lack of adequate or proper warm-up activity. [3, 4]

The goal of a warm-up activity is preparing the body physiologically and psychologically through physical activity to meet the physical demands of the sport. In a warm-up condition, an increase in body temperature will promote blood flow; increase muscle temperature, increase neural activation and increase joint range of motion.[5]An effective warm-up can not only reduce injury, but also is known to improve performance due to increased muscle compliance, increased reaction time, and more efficient movement.[6]Current literature highlights the importance of the dynamic warm-up approach that includes drills that engage agility, strength and neuromuscular control as opposed to only pre-competition static stretching and warm-ups.[7,8] Structured warm-up programs, including the FIFA 11+, are now a recognized global standard in injury prevention in football. Research shows that use of the FIFA 11+ program on a regular basis can reduce injuries by 30–40% and improves players' agility and coordination.[9,10]

Despite the research support, real world adherence to structured warm-up programs has been inconsistent, especially among amateur and youth athletes, where the previous warm up methods can be outdated and incomplete, due to lack of knowledge, situational factors, or supervision and instruction.[11] One study of high school sports teams found that while the majority of athletes reported recognizing the benefits of warming up, few athletes engaged in a structured warm-up program; even fewer did so as well as FIFA 11+.[12]Furthermore, other research has reported that adherence to warm-up programs is often significantly lower at follow-up, resulting in lower injury deterring effectiveness.[13]

Like any new behaviour or skill, knowledge about warm-ups is not sufficient; the quality, structure and consistency of a warm-up occur in practice measures the capacity and effectiveness of the warm-up toward injury prevention The knowledge-practice gap exists for structured warm ups, but education or dissemination of a model of an evidence-based warm up, could help reduce this gap.[14] Finally, agility, which is the ability to take-off, stop, and move in a new direction or accelerate quickly after a stimulus is a vital skills requirement for football.[15] A warm up that includes agility drills, reactive tasks and coordination tasks would be an effective warm up as it prepares a player's muscles and nervous system for the specific directional changes that are present during match-play. Alternatively, avoiding quality warm-ups can influence muscle activation and affect coordination, increasing the likelihood of injury.[16,17]

For young adult football players aged roughly 18 - 30, preserving agility and reducing injury prevalence is vital for both long term performance and career longevity. This study, “Co-relation between Warm-up Knowledge and Injury Prevalence in Football Players”, aims to determine players' comprehension and ability to utilize observed warm-ups and their correlation relative to their injuries. The key objectives are to assess football players' understanding of warm-up protocols. Establish injury prevalence among respondents. Note the statistically significant correlation with warm-up knowledge relative to injury. The expected result is meant to support physiotherapists, coaches, and/or sport educators to enhance education and prevention approaches. The awareness and application of structured warm-up protocols will keep players safer, allow for better performance, and contribute towards uninterrupted participation and improvement of injury prevention in football.

NEED OF THE STUDY:

While warm-up routines offer significant benefits, they are often not executed properly due to a lack of understanding. Addressing this knowledge gap is essential for changing behaviours, which can lead to fewer injuries and greater benefits from warming up. it’s important to evaluate their current awareness and practices related to warm-up techniques

Population And Sample

Sample Size: 150

Data And Sources Of Data

Study Design: Correlation survey study

Study Type: Correlation study

Theoretical Framework

The aim of this investigation was to evaluate the relationship between knowledge, practice, and injury occurrence in football players, with specific focus on how knowledge of warm-up routines manifests in practice and reduces the risk of injury. Warm-up has been acknowledged for many years as a fundamental component of an athlete's performance. However, the application in practice, and how effective athletes perceive warm-up to be vary greatly amongst sporting populations. The study looked into whether players' theoretical knowledge of warm-up exercise influenced their practical implementation and whether implementation influences the occurrence of

injuries. The study's aim was identified in order to clarify the similarities between knowledge and understanding of behaviour of sports participants in terms of injury risk prevention.

This study further intended to explore the implications of a prescribed warm-up education as a protector of injury risk behaviour to improve physical preparedness, reduce risk of injury, and improve quality of training in athletes. The study determined that most football players possess a satisfactory degree of knowledge and have practices in place to conduct warm-up activities prior to training or competition activities. This means that the large majority of athletes are conscious of at least some of the physiological benefits of warming up prior to athletic activity – such as increased flexibility of muscles, improved blood flow, and better neuromuscular coordination. This indicates that most athletes are aware of the physiological benefits of warming up, such as increased muscle flexibility, enhanced blood circulation, and improved neuromuscular coordination.

Even though the players were well-aware of the risks associated with not warming up properly, the injury rates were still remarkable in the study group, indicating that awareness of risks does not guarantee injury prevention. This finding reveals a disconnect between awareness and action. While players seemed to value warm-up routines with an apparent understanding of their importance, there was a lack of execution, whether due to technical execution or consistency. The results of this study indicate that some coaching supervision, guiding athletes to include both proper warm-up programs and specific techniques, and reinforcement of correct warm-up practices based on the theory at play, would enhance athletes' ability to apply their understanding of proper warm-up techniques in practice. Following this, the correlation analysis indicated a positive correlation between knowledge and practice with injuries, suggesting that those who were more aware and had better warm-up habits also reported more injuries.
This may be indicative of increased exposure to physical load, as well as a higher volume of participation adherence, among more experienced players. Individuals at higher skill levels find themselves in more competitive or high-load environments, thus increasing the risk of sustaining overuse or contact injuries. An alternative explanation may be that while these players regularly perform warm-up exercises, the exercises may not be specific enough to the demands of the sport. The data, overall, suggest that the specifics of warm-up practice may be more important than the practice itself. For injury prevention to be successful, it is not just sufficient to implement warm-ups; they must also be scientifically based, progressive in design, and supervised by trained professionals that can meet the specific needs of each athlete. The implications for practice provide valuable evidence-based insights for athletes, operators, coaches, and physiotherapists involved in preparation and rehabilitation of sports performance.
This study provides evidence of the important role of warm-up education and

supervision within strategies to manage injury and improve athletic performance. By adopting heated or specific warm-up practices to their regular training, sports teams can prepare players for physical challenges while at the same time mitigating the risk of musculoskeletal injury. The research further emphasizes that the practical applications of this study are important for athletes, coaches, and physiotherapists who work in sports training and rehabilitation. The findings highlight the importance of proper warm-up education, direction, and oversight as part of injury management and performance improvement strategies. By incorporating structured warm-up sessions to supplement typical training, teams can ensure their players are prepared for physical activity while also reducing the likelihood of musculoskeletal injury.

RESEARCH METHODOLOGY

A self-prepared questionnaire in simple English was developed to assess football players' knowledge and practice regarding warm-up routines and the prevalence of common musculoskeletal injuries. The questionnaire was validated by five physiotherapist and then circulated among players from various football academies and clubs in and around Pune and Mumbai. Participants were selected using purposive sampling based on the inclusion and exclusion criteria. After obtaining informed consent, the questionnaire was administered in the presence of the researcher to clarify any doubts The collected data were tabulated and analysed using descriptive statistics, including mean, standard deviation, percentage, and frequency distribution, to identify trends and relationships between warm-up knowledge, practice, and injury prevalence

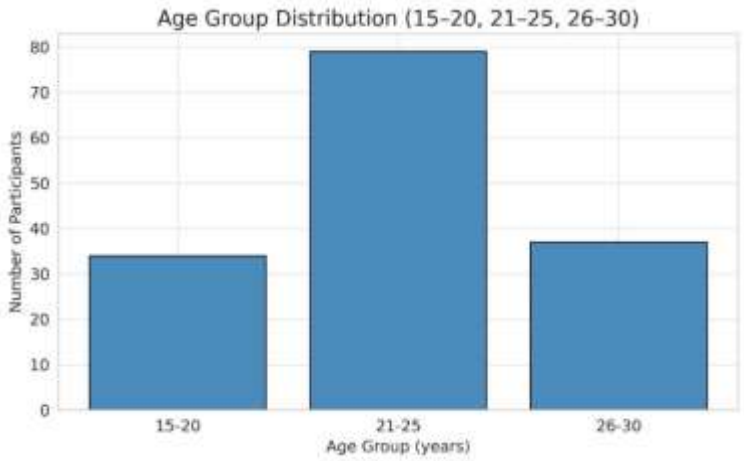
DATA ANALYSIS & RESULT:

The purpose of this study was to investigate if football players warmed up before training or games, their understanding of warm-up, and the relationship between knowledge of warm-up, warming up, and reported injuries. Data was collected from 150 football players via Likert-scale questionnaire, and responses were analysed descriptively and analysed using Pearson's correlation analysis.

Descriptive Statistics:

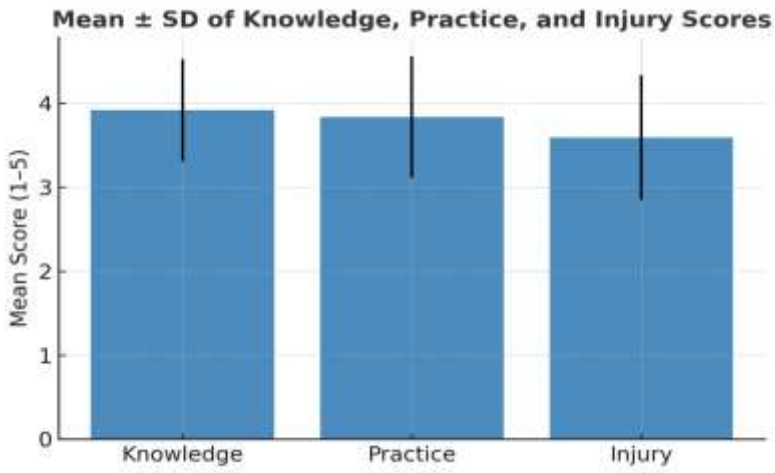
Age Distribution:

Graph 1 : Bar diagram for age distribution of participants:



his displays the age distribution of the study sample (N = 150). The sample comprised three age categories: 15–20 years (N = 29, 19.33%), 21–25 years (N = 68, 45.33%) and 26–30 years (N = 53, 35.33%). The 21–25 years age group represented the largest proportion of athletes in the study, at 45.33%, while the second largest proportion was in the 26–30 years group, at 35.33%, and finally the 15–20 years group making up 19.33%. The age group data demonstrates that the majority of the participants were young adult athlete's representative of early-career to mid-career football players, which infers that the results are most applicable to football players that are in high stages of physiological development.

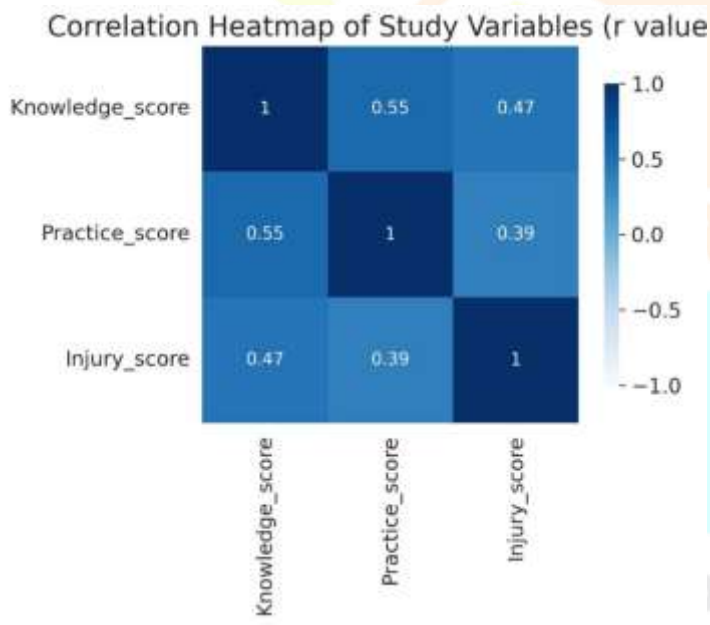
Graph 2 Mean ± SD of Knowledge, Practice, and Injury Scores:



INTERPRETATION :

This depicts the mean and standard deviation scores across the three relevant domains from the survey: Knowledge (M=3.919, SD=0.608), Practice (M=3.836, SD=0.722), and Injury (M=3.593, SD=0.743). Players were aware of the rationale, timing, and components of warm-ups at the highest level (M=3.919), or overall, rated this domain most favourably. The Practice scores were slightly lower than Knowledge (M=3.836) and were separated by just 0.083 points. While limited, this score represents some variability in situation to implementation or habitual behaviour, or a translation gap. The domain scores for Injury (M=3.593) reflect moderate reporting of injury experiences or perceptions among this group of players. The comparison of standard deviations indicates that Practice (SD=0.722) and Injury (SD=0.743) have greater variability compared to Knowledge (SD=0.608), supporting that players generally agree on knowledge but are less uniform regarding behaviours and injury experiences. This practical perspective supports interventions that promote awareness and that assure standardized and high-quality implementation of warm-ups across players for uniformity in protective outcomes. Mean and SD values provide a clear numerical basis upon which to work from in designing training and preventative programs

Graph 3 Correlation Heatmap among Study Variables:



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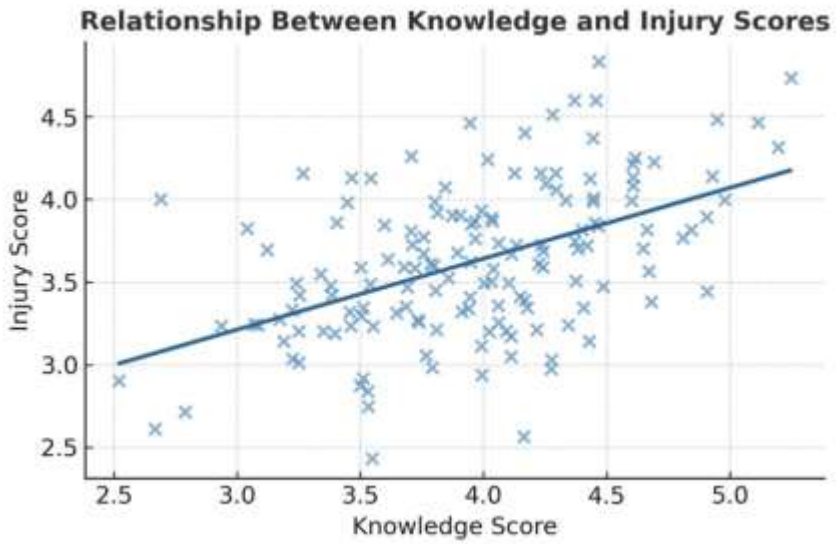
INTERPRETATION:

This shows the Pearson correlation matrix for section mean scores. Our analysis found a moderate and statistically significant positive correlation between Knowledge and Practice ($r = 0.534$, $p < 0.001$). The moderate positive correlation indicates that increased knowledge of warm-up concepts is related to greater self-reported warm-up behaviour. Also, Knowledge was positively correlated with Injury ($r = 0.448$, $p < 0.001$)

and Practice was positively correlated with Injury ($r = 0.460$, $p < 0.001$). For these last two results, our findings indicate that participants who reported more knowledge and reported more practice also reported higher injury. Although this might seem to counter the expectation that knowledge and practice would limit the potential for injury, we can explain these associations through exposure-driven mechanisms: those athletes that demonstrate greater knowledge and more reported practice might also have greater training and competition loads, and therefore more opportunity for an injury event to occur. Another possible mechanism is differential reporting: more knowledgeable athletes may recognize and report injury more readily. Importantly, the p-values suggest the associations were not due to random variability in the sample. So, these findings suggest multivariate analyses controlling for exposure and prior injury history to better understand causal pathways.

Graph 4: Relationship Between knowledge and Injury Scores:



INTERPRETATION:

This displays a comparison of Knowledge scores and Injury scores across pairs of the incidence measure. The mean Knowledge score ($M \approx 3.92$) falls very close to the overall domain mean and Injuries ($M \approx 3.59$) is very close to its overall mean. The scatterplot suggests a positive linear relationship (slope ≈ 0.45 according to regression), consistent with the moderate Pearson correlation ($r = 0.448$ ($p < 0.001$)). The positive relationship between Knowledge and Reports of Injury suggests that players who believe they are more knowledgeable about warm-up also have higher levels of reported injuries. The observed pattern of relationship could indicate that in regards to the multifactorial nature of injury causation, the players with higher levels of self-reported knowledge may also inherently be those that have participated at a higher volume in competitive opportunities, which might increase risk related to exposure.

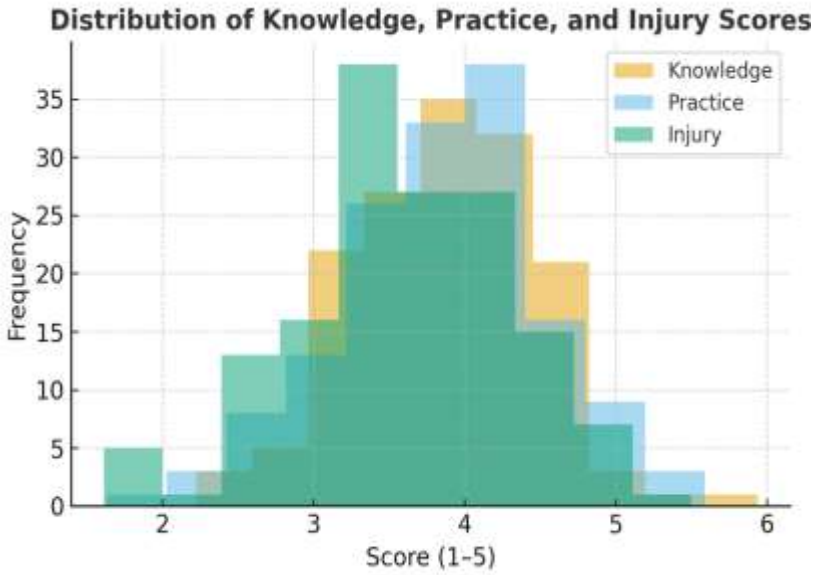
The spread of points also appears to have relatively high variability surrounding the regression line, which is also consistent with the moderate SDs (Knowledge SD = 0.608; Injury SD = 0.743), indicating variability within individuals. Therefore, more knowledge plausibly promotes an opportunity to potentially mitigate injury incidence; however, knowledge alone would be necessary but insufficient and this may also depend on the accuracy of performance, rather than knowledge, on the warm-up, design of a sport specific program, and potential for training loads and recovery to be monitored concurrently with the warm-up program.

Graph 5. Relationship Between Practice and Injury Scores:

INTERPRETATION:

This illustrates the relationship between Practice scores and Injury scores, displaying a positive linear relationship (Pearson $r = 0.460$, $p < 0.001$). Within the paired data analysis, the mean for Practice, was about 3.836, and the mean for Injury, was about 3.593. The positive slope (≈ 0.46) denotes that athletes reporting more engagement in some warm-up practices reported more injuries. The implications of this relationship are reasonable, that athletes who train greater frequency and intensity consistently incorporate warm-up more often, and that they get injured more because of greater cumulative exposure to activity. Another factor to consider is quality of practice: warm-up performed frequently, even if unsafe, or no progression, or no sport-specific qualifiers may not result in full injury prevention regardless of frequency of warm-up. Wider SD (0.722) seen in preparation, relative to SD seen in Knowledge, indicate variability in approach and adherence in intensity of warm-up motions, affecting and interacting the relationship with injury sustained. Overall, these findings present evidence for developing not only the involvement in warm-up, but the notion of time and program designed right with physiotherapist and coaches to maximize prevention.

Graph 6 : Distribution of Knowledge, Practice, and Injury Scores:



INTERPRETATION:

The histogram shown in Figure illustrates the distribution of individual participants' mean scores for the Knowledge (M = 3.919, SD = 0.608), Practice (M = 3.836, SD = 0.722), and Injury (M = 3.593, SD = 0.743) contributions to the overall weights. The histogram portrays that scores on the Knowledge component cluster closely together on the higher end of the scale (4-5), suggesting that players are relatively aligned and consistent in their knowledge. Practice scores are also skewed towards the higher interval, but distributed over a wider range than the Knowledge scores, indicating variability in the ways players engage with warm-up practices. The distribution of scores for Injury poses a wider range, meaning they have and experience different injuries than others (e.g., may have reported very little experience versus over a very long period), demonstrating variability across all players involved. Even with the variation in their scores, it is evident from the distribution that good Knowledge is widespread across players from these teams, but that Practice and Injury experiences vary for each player. This distributional trend indicates that if managers and trainers are going to train a better practice, and thus very likely injury reduction, a well-developed plan for warm-ups needs to prioritize at the very least a standardized warm-up technique. The absence of an advanced plan or any standard warm-ups have indicated some injury may go into account of systematic warm-ups. Rather than growing or trying to convince this player or a group of players to do warm-ups may be, a straightforward assessment of how to change loads could work best at the time, and the means and SD help narrow in on the priorities from a change perspective.

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