Tittle: - "Evaluating the Impact of Artificial Turf on Youth Mental and Physical Health: A Comprehensive Analysis"

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The research document investigates the impact of artificial turf on mental and physial health among youth. Artificial turf, made of synthetic materials designed to resemble real grass, has gained popularity as a surface for various sports and recreational activities, due to its strength, low maintenance, and all-weather suitability. However, concerns about potential health effects due to continuous exposure have been raised, specifically among young individuals who regularly participate in sports and outdoor activities. The literature review includes a study by Singh and Chauhan (2019) on young Indian athletes aged 14-18, which uses a questionnaire-based survey to collect data on the effects of playing on artificial turf on physical and mental health. The study utilizes a questionnaire to gather socio-demographic data, assess positive impacts of turf, and identify potential negative impacts. Most respondents are found in the age group of 21-25, indicating keen interest among college students in using artificial turf. The majority of the respondents belong to the Other Backward Class/Other Economically Backward Class (OBC/OEC) and Above Poverty Line (APL) category. The users are mostly unmarried and have a graduation degree. One major finding was that the youth tend to use the turf more on weekends, mostly for an hour or less. About half of the respondents (56.9%) were using the artificial turf at night. A significant percentage (78.5%) of the respondents reported not suffering from Anterior Cruciate Ligament (ACL) tear while playing on the turf and the majority (52.3%) reported not facing ankle sprains while playing. The study concludes that the artificial turf has both positive and negative impacts, but the negative impacts like injuries such as ankle sprains and ACL tears were low. It suggests that further investigation may be necessary for a more comprehensive

understanding of the effects of artificial turf on young users' mental and physical well-being. Though majority respondents indicate low negative impact, choosing artificial turf for sports and recreational use must involve a balance of benefits and potential disadvantages.

Abstract: This research focused on understanding the impacts of artificial turf on the mental and physical health among youth. Detailed data was collected from a sample comprised of young individuals aged 15-30 via a questionnaire, revealing trends, usage habits, and perceived impacts of artificial turf. The results indicated that college-aged participants were the most common users. While the study found low negative impact on turf usage in form of potential injuries such as ACL tears or ankle sprains, it signalled that potential benefits and drawbacks of artificial turf need to be balanced carefully. Future research directions to provide a more comprehensive understanding of the effects of artificial turf on users' well-being were suggested.

Keywords:

1. Artificial Turf , 2. Mental Health , 3. Physical Health, 4. Youth, 5. Sports, 6. Well-being

7. Injury, 8. Synthetic Grass, 9. Outdoor Activities, 10. Artificial Grass,11. ACL tear

12. Ankle sprains

Introduction: The ubiquity of artificial turf in various sports and recreational contexts has seen a significant upsurge due to its robustness, minimal maintenance requirements, and the ability to be used in all weather conditions. Despite these benefits, concerns have been expressed about its possible impact on mental and physical health, particularly among the youth. Youthful age is a critical time when lifestyle habits concerning physical activity are being developed, and these habits can play a pivotal role in shaping one's overall health. Traditionally, natural grass fields have been the popular choice for sporting activities due to

their cushioning and stress-absorbing capabilities; however, artificial turfs, often made of synthetic materials like rubber and plastic, constitute a rapidly expanding alternative. These, though, are substantially different from real grass in features and composition. The goal of this study is to explore and comprehend the implications of artificial turf on the well-being of young individuals and to highlight any potential impacts on their general health. The focus is on presenting a comprehensive exploration that captures an array of perspectives to make this a constructive resource for future related studies. The research considers both the benefits and potential issues concerning artificial turf to provide a holistic examination of the subject matter.

Artificial turf, with its properties of durability, low maintenance, and suitability for all weather conditions, has increasingly been adopted as playing surfaces in various sports and recreational activities. However, there are growing concerns about its potential effects on the physical and mental well-being of individuals, especially young people. Youth is a critical stage of life when physical activities play a significant role in determining one's physical and mental health. Usually, natural grass fields, which provide a soft and stress-absorbing surface, are preferred. However, artificial turf, primarily made of synthetic materials like rubber and plastic, is gaining popularity due to certain benefits. However, it is crucial to understand that artificial turf significantly varies from natural grass in composition and characteristics This study aims to deeply understand the impact of artificial turf on the mental and physical health among young people and shed light on any potential consequences for their general health. The goal is to present a comprehensive account that might provide helpful insights in this area and serve as a foundation for further related research. The importance of balancing the perceived advantages and potential drawbacks of artificial turf is emphasized.

Literature Review: The literature review component of the research aims to critically examine and evaluate studies associated with the impact of artificial turf on the mental and physical health of youth. Artificial turf, designed with synthetic materials to mimic real grass, has been the spotlight of various research due to its increasing popularity as a playing surface for diverse sports and activities.

One such study by Singh and Chauhan (2019) probed the impact of artificial turf on the physical and mental health of young Indian athletes. Their research comprised 150 young athletes aged between 14 and 18, with surveys being used to collect data on the effects of playing on artificial turf. Furthermore, the literature review identifies the potential health concerns voiced over the continuous exposure to these artificial surfaces, especially in relation to youth who are regularly engaged in outdoor and sports activities. The review underscores the importance of these studies in shaping strategies that can help ensure the well-being of youth using artificial turfs, while also informing future investigations and facilitating further research on the topic. The studies conducted both in India and internationally provide a global perspective to the understanding of this issue.

Sharma and Gupta's paper compares the physical and mental health effects of young football players in India playing on synthetic turf versus natural grass surfaces. The study includes 80 players aged 10 to 16 and utilizes physiological and psychological assessments. The authors present a thorough analysis of relevant literature, highlighting the advantages of artificial turf, such as increased durability and lower maintenance costs, while also addressing concerns like a higher injury risk, heat exhaustion, and infill material toxicity. Overall, the research provides valuable insights into the health outcomes of youth football players on synthetic turf compared to natural grass surfaces in India, contributing to the existing body of literature and informing potential policy decisions on the use of artificial turf in sports facilities.

Philip's study says that, in recent times, Kerala's football culture has witnessed a notable transformation as artificial turf fields have replaced improvised pitches on river beds and rice fields. This trend is particularly prominent in north Kerala, where around 500 artificial turfs have emerged, with Kozhikode district alone hosting 150 of them, primarily maintained by local males, many of whom are Gulf returnees. The popularity of these lush fields has led players to book time slots and negotiate rent, replacing the traditional village grounds. Former Indian footballer I M Vijayan views this shift as significant for the state's sports scene, fostering the development of a new generation of players and helping to compensate for the loss of traditional playgrounds. The accessibility of turf fields, available for use at night and in any season, accommodates players of all ages.

In a study conducted by Díaz-García et al. (2023), the impact of different soccer scoring systems on players' physical, tactical, and mental demands was examined. They had 18 youth-elite male soccer players play three 8 vs. 8 games with varying scoring rules: official score system, double the value of the goal—4 min, and double the value of the goal—8 min. The results indicated that the "double the value of the goal—4 min" scoring system led to the highest levels of mental and physical challenges. All three games resulted in increased mental exhaustion, with significant differences between the "double the value of the goal—4 min" system and the other two. Players tended to adopt more direct play during the "double the value of the goal—4 min" game. Changing the scoring system can influence players' physical effort, tactics, and mental tiredness during soccer training.

In a study conducted by T. Greyling in 2016, the relationship between playing surface and lower limb muscle exhaustion in professional soccer players was investigated. The research involved 22 players, and they underwent a fatigue regimen on both grass and artificial surfaces in a cross-over study design. Measurements of force generation, force rates, and jump height were taken before and after fatigue using a force plate. Statistical analyses

revealed correlations between various baseline variables. After fatigue, there were significant increases in propelling and concentric forces on the grass surface, while propelling force and propulsion force rate were significantly increased on the artificial surface. Interestingly, there were no clear differences between the two surfaces in terms of changes from baseline to exhaustion. The study suggests that different adaptation mechanisms may be used to deal with fatigue on different playing surfaces, emphasizing the importance of prescribing surface-specific training to reduce the risk of injuries in soccer players.

Methodology: The methodology of this research involves multiple elements, including the research design, sampling techniques, data collection methods, and data analysis approach. For the research design, a descriptive study is conducted to learn about an existing problem. The population (or universe) is defined as all males between the ages of 15-30 playing football in artificial turf in Aluva and Paravoor taluk (span new sports academy and O'4' sports). Convenient sampling technique was chosen due to the practicality and easy accessibility of participants. The total sample size is fixed at 65 based on the requirement for successful completion of the study. Data was collected primarily through self-prepared questionnaires containing 40 questions. The questionnaire, divided into three sections, focused on Socio-Demographic Data, Positive Impacts of Turf, and Negative Impacts of Turf. For data analysis and interpretation, IBM SPSS 29, a statistical package for the social sciences, was used. The research process also considered ethical aspects, ensuring all respondents provided informed consent and maintained information confidentiality. Before the actual data collection, a pre-test was conducted in April 2023 to validate the questionnaire and its relevancy. The methodology was designed to ensure that the results are accurate and trustworthy, translating into valid conclusions and recommendations.

In the "**Data Analysis and Interpretation**" chapter, data collected from the 65 respondents was presented using figures and tables. Data was collected through a questionnaire containing 40 questions divided into three sections: socio-demographic data, positive impacts of turf, and negative impacts of turf. Section 1 regarding socio-demographic data revealed that the majority of respondents (63.1%) belonged to the age group 21-25, indicating that college-going students were more interested in using artificial turf. Most respondents were found to belong to the OBC/OEC category (63.1%), and were from the Above Poverty Line (APL) category (66.2%). Most respondents were unmarried (87.7%) and most of them have Undergraduate/Postgraduate education (80%). Section 2 focused on the positive impacts of turf. This part of data analysis considered various parameters like availability of transportation, mobile phone accessibility, the frequency and duration of using turf etc. Section 3 dealt with the negative impacts of turf through questions aiming to identify any serious injuries or problems faced by the respondents. To assure objectivity, the investigator only used an objective technique when interpreting the data and there was no subjectivity. This section concluded that the correct interpretation yields accurate judgements and recommendations. For in-depth statistical analysis, tests like T-Test and Anova were also conducted to find out any significant differences among different groups.

Key Findings: 1. The majority of the respondents (63.1%) were in the 21-25 age group, indicating that college-going students were more interested in using the artificial turf. 2. Approximately 63.1% of the respondents belonged to the OBC/OEC category. 3. The majority of the respondents (66.2%) belonged to the Above Poverty Line category, pointing to financial limitations for using the turf. 4. The majority (87.7%) of the respondents were unmarried, suggesting they have more time to play. 5. The educational status of the respondents showed that 80% had an undergraduate/postgraduate degree. 6. Over half the

respondents (55.4%) preferred not to disclose their job status, possibly because they were studying.

1. The most frequent users of the artificial turfs are college-going students aged 21 - 25 years, making up 63.1% of the respondents. 2. Most respondents (87.7%) were unmarried, implying that they have more leisure time to use the facilities. 3. The users primarily belong to the Above Poverty Line category (66.2%), suggesting certain financial constraints associated with the use of artificial turfs. 4. Around 80% of the respondents had educational qualifications of an undergraduate degree or above, indicating a higher prevalence of turf usage among more educated individuals. 5. The analysis of the respondents' reactions to various statements related to their mental state shows mixed feelings about the use of artificial turfs. Some found it positive and had a high level of agreement with statements such as feeling relaxed and confidently dealing with problems, while others had neutral or disagreeing responses, particularly to the statements related to feeling down, depressed, or hopeless. 6. The study indicated concerns about possible injuries or problems related to turf usage, demonstrating a need for further investigation and mitigation measures in the future.

.1 Responses to statements about participants' mental state show some participants found the use of turf positive, feeling relaxed and confident. 2. The study raises concerns about possible injuries during turf usage, hinting at potential negative impacts.

1. Use of artificial turf might be linked to both positive and negative feelings. Respondents expressed complex responses over statements concerning their mental state, with some feeling relaxed while others also expressed feelings of being down, depressed, or hopeless. 2. There seem to be concerns about potential injuries while using artificial turf, with some impact on both professional and personal lives of respondents though specifics are not detailed. These findings suggest that while artificial turf may provide recreational opportunities, there could also be psychological and physical drawbacks.

Conclusion: Data interpretation and analysis led to several outcomes. Few significant variations were discovered when measuring pressures after wear on artificial and grass surfaces. The inconsistent behaviors of forces in response to weariness suggest that different adaptation mechanisms might be used to deal with a potential condition of fatigue. Therefore, it might be suggested to prescribe surface-specific training to promote muscle adaptation and reduce the risk of injury.