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Rajesh CB
Department of Physical Education, NSS College of Engineering, Palakkad, Kerala, India

Jagannadhan C
Department of Physical Education, Government College, Chittur, Palakkad, Kerala, India

Corresponding Author:
Rajesh CB
Department of Physical Education, NSS College of Engineering, Palakkad, Kerala, India

Demographic determinants of sports performance in collegiate athletes: A quantitative analysis

Rajesh CB and Jagannadhan C

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Abstract
This study investigates sports performance and its association with demographic characteristics like gender, religion, education, and locality among collegiate athletes in Kerala. The sample was comprised of 211 athletes (male=82; female=129) from selected colleges affiliated with four major universities in Kerala. A specially constructed demographic questionnaire was used for data collection. Descriptive statistics and Chi-square were used to analyze the data. The bar charts were used to provide a graphical representation of the results and to understand the distribution visually. The findings indicate that the demographic characteristics related to education status and athletes' living locality show a significant relation with sports performance. Other demographic characteristics like gender and religion have no significant correlation with his/her sports performance. This study definitively answers the question regarding sports performance and its association with demographic characteristics in Kerala athletics.

Keywords: Kerala athletics, sports, demographic characteristics, sports performance, athletics

Introduction
Participation in sports in India has increased tremendously in recent years. The central and state governments are paying more attention to making policy matters related to sports infrastructure development to improve sports participation. Authorities claimed that sports have the power of interlinking the individual with its society and it will demolish the disparities in societies. In our country, the public and private sectors give much more importance to the sport because of its role in community regeneration. This shows a picture of one side of the coin; the other side shows the struggle and obstacles related to sports performance. Arthur Robert Ashe, the American professional tennis player, wrote a clear picture of racism in sports in his famous book "A Hard Road to Glory: A History of African American Athletes, since 1946". At the beginning of 1918, the boxing bouts are a land of racial murders. The sober people from profound religions are the main spectators' of the bout. The unethical competitions will lead the participants to permanent physical and mental harm. Demographic factors like race, religion, and gender ruled and ruined sports competition and sports performance.
In this modern era of sports, culture believes that the drastic changes in sports infrastructure have made changes in demographic characteristics and sports participation to a greater extent in sports performance. The geographical condition of the peoples of each state and its district, villages having the choice in selecting sports events. Apart from this, the studies in this area explain the importance of demographics in sports participation and performance. The literal meaning of the word demography is "a description of people", derived from the Greek words "demos" (people) and "graphia" (description of). Sports performance is a complex mixture of many factors.
Kerala has a glorious history in track and field athletics; even in the history of Indian athletics, Kerala holds a remarkable position due to its meritorious achievements in athletics. Kerala is known as the 100% literate state in India; the universities play a vital role in the state's literary revolution. The major Universities are giving priority to sports activities in Kerala. These Universities are producing and directing talented athletes to the path of success in their sports careers. In recent years, the results from collegiate athletics in the state show stagnation in performance, especially in track and field athletics. The other states in the county show a drastic development in this field compared to the performance of Kerala athletes. The performance of athletes from various universities in Kerala in the recently completed Khelo India competition was a real example of the deterioration in the state's athletic performance.

These factors lead scholars to determine whether demographic factors have any relation to athletic performance. The objective of this study is to identify the influence of demographic characteristics on the sports performance of collegiate athletes in Kerala.

1.1 Hypotheses

- **H_1:** There is no significant relationship between the selected demographic characteristics and sports performance.
- **H_2:** There is a significant relation between selected demographic characteristics and sports performance.

2. Literature review

Gupta (2019) [2] investigated the relationship between gender, caste, and academic performance among engineering students. The results revealed that caste was significantly associated with academic performance; students belonging to lower castes performed more poorly in their studies, with male students from lower castes experiencing greater deterioration in performance than their female counterparts within the same caste structure. Also examined the relation between demographic characteristics and motivation in both academic and athletic performance, finding that male students displayed higher extrinsic motivation than females in both domains. Farrell *et al*. (2002) [4] reported that individuals with higher education levels were more likely to participate in sports. Timmerman (2000) [5] studied the effects of racial and age diversity on team performance, demonstrating a significant and negative correlation between both forms of diversity and team performance. Pelled *et al*. (1999) [6] found that racial diversity was related to an increase in emotional conflict within teams. Furthermore, Williams and O'Reilly (1998) [7] observed a small or inconsistent relationship between age diversity and sports performance.

3. Methods and Materials

The study was comprised of 211 subjects. Out of them, 129 female athletes and 82 male athletes aged between 18 to 25. The data was collected from the colleges affiliated with the Universities that excelled in sports activities (the University of Calicut=67, University of Kerala=29, Mahatma Gandhi University=99 and Kannur University=16) of Kerala state by using a purposive sampling technique. Specially constructed demographic questionnaires were used for data collection. From this data, athletes were categorized into four categories according to their participation level: University level, State level, National level, and International level.

3.1 Data collection

We sought prior permission from the concerned departments of the athletes who were studying in various colleges under each university. For active participation in the survey, we selected days of the athlete's weekly workout schedule to gather information. Due to this decision, the data collection was not affected by their daily workout schedule. Before supplying the questionnaire, scholars explained the nature and purpose of the study and assured us that the personal information gathered would be kept confidential. The participants were acknowledged for their active participation and cooperation in this study.

4. Results and Discussion: Descriptive statistics and Chi-square were used to analyze the data; bar charts were used to represent the results visually and understand the distribution. The statistical software SPSS-version (22.00) was analyzing the data.

Association of gender with performance level

The chi-square test is used to test the null hypothesis that there is no significant association of gender with the performance level of the athletes.

Table 1: Frequency distribution

	Male	Female	Total
University	15	27	42
State	30	35	65
National	35	54	89
International	2	13	15
Total	82	129	211

It can be observed that 211 athletes took part in the study, out of which 129 were females and 82 were males.

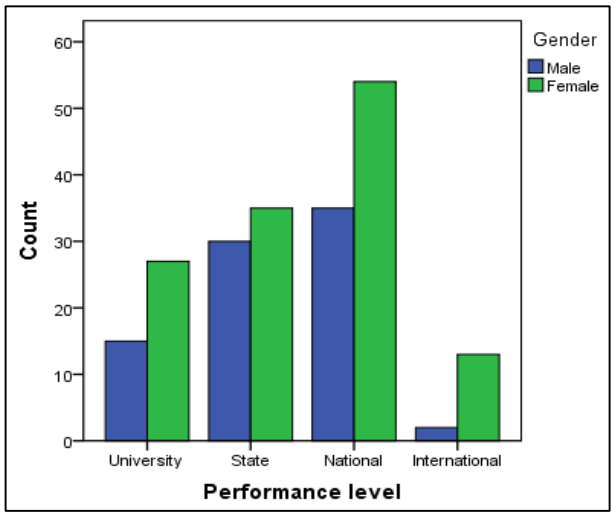

Fig 1: Bar chart of gender

The results of the chi-square test suggest that there is no significant association of gender (chi-square (3)=5.752, p-value=0.124) with the performance level.

Table 2: Chi-square test

Chi-Square Value	DF	Asymp. Sig. (2-sided)
5.752	3	.124

Association of religion among performance level

The chi-square test is used to test the null hypothesis that there is no significant association of religion with performance level.

Table 3: Frequency distribution

	Hindu	Christian	Muslim	Total
University	22	16	4	42
State	39	24	2	65
National	47	34	8	89
International	8	7	0	15
Total	116	81	14	211

The above table suggests that there are significantly fewer Muslim athletes taking part in events.

The results of the chi-square test suggest that there is no significant association of religion (chi-square (6)=4.246, p-value=0.643) with the performance level.

Table 4: Chi-square test

Chi-Square Value	DF	Asymp. Sig. (2-sided)
4.246	6	.643

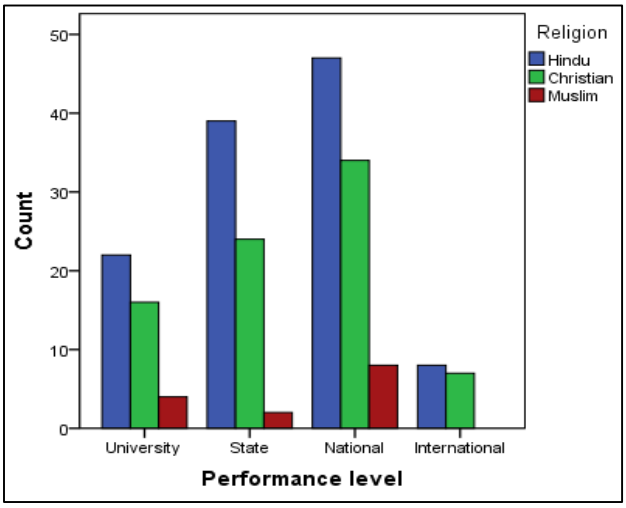

Fig 2: Bar chart of religion

Association of university among performance level

The chi-square test is used to test the null hypothesis that there is no significant association between university and performance level.

Table 5: Descriptive statistics

	Kerala	M.G.	Calicut	Kannur	Total
University	8	24	9	1	42
State	11	38	9	7	65
National	8	33	41	7	89
International	2	4	8	1	15
Total	29	99	67	16	211

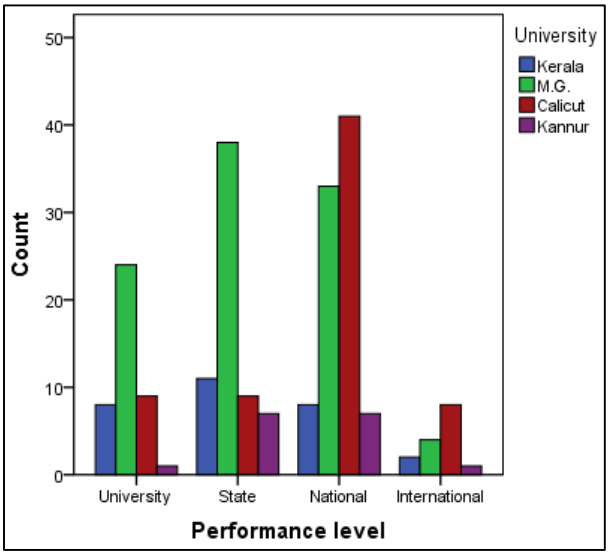

Fig 3: Bar chart of the University

For Kerala, M.G., and Kannur universities, the highest number of athletes participated in state events, but at Calicut University, the highest number of athletes participated in national events.

Table 6: Chi-square test

Chi-Square Value	DF	Asymp. Sig. (2-sided)
27.045	9	0.001

The results of the chi-square test suggest that there is a significant association between university (chi-square (9)=27.045, p-value=0.001) and performance level.

Association of subject of study among performance level

The chi-square test is used to test the null hypothesis that there is no significant association of the subject of study with performance level.

Table 7: Frequency distribution

	Arts & Commerce	Science	Total
University	38	4	42
State	49	16	65
National	78	11	89
International	13	2	15
Total	178	33	211

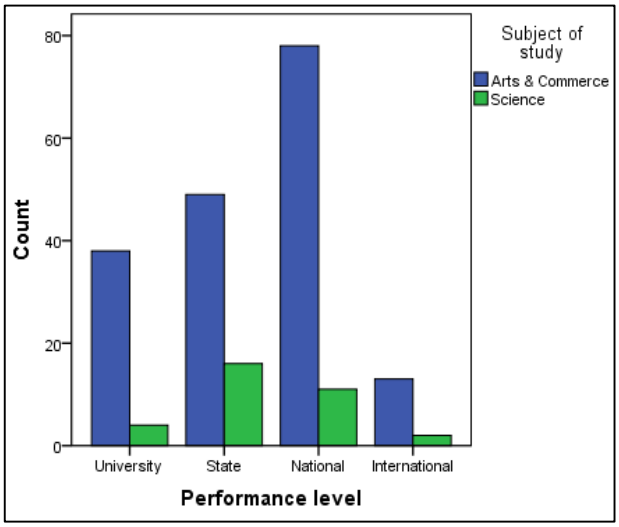

Fig 4: Bar chart of the subject of study

Table 8: Chi-square test

Chi-Square Value	DF	Asymp. Sig. (2-sided)
5.946	3	0.114

The results of the chi-square test suggest that there is a significant association between the subject of study (chi-square (3)=5.946, p-value=0.114) and performance level.

Association of subject of locality among performance level

The chi-square test is used to test the null hypothesis that there is no significant association of locality with performance level. The frequency distribution is given below.

Table 9: Frequency distribution

	Rural	Urban	Total
University	29	13	42
State	52	13	65
National	77	12	89
International	13	2	15
Total	171	40	211

Table 10: Chi-square test

Chi-Square Value	DF	Asymp. Sig. (2-sided)
6.024	3	0.110

The results of the chi-square test suggest that there is a significant association of locality (chi-square (3)=6.024, p-value=0.110) with the performance level.

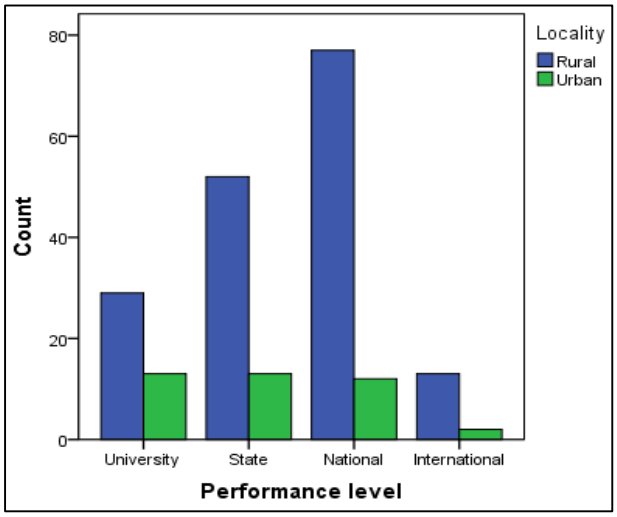

Fig 5: Bar chart of the locality

5. Discussion on findings

The research aimed to investigate the interrelation or association between demographic factors and athletic performance among collegiate athletes in Kerala. The H1-Null hypothesis was rejected in the case of participants studying university, academic subject, and locality. Other demographic characteristics, such as gender and religion, do not influence sports performance.

6. Conclusion

The study concluded that demographic characteristics like the university where the athlete was studying the course or subject opted for the study. The locality where the athlete was born and brought up had a high and positive correlation, and these demographic characteristics played as the determining factor of athlete sports performance. The other selected demographic characteristics for this study, like gender and religion, had a low level of association with their sports performance. The result of the present study indicates that demographic characteristics are the major predictors of sports performance.

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