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Comparative Analysis of Health-Related Lifestyle Among Retired Professional Players of Different Sports

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Abstract
Background: Retirement from competitive sport is among the most crucial transitions in an athlete's life, yet its association with long-term health-related lifestyle remains poorly characterised in India, where systematic, multi-sport, discipline-specific evidence is lacking.
Objective: This study evaluated and compared health-related lifestyle across eight dimensions like alcohol and drug habit, emotional and intellectual wellness, nutrition, physical fitness, social wellness, spiritual wellness and stress management and a composite score among retired male professional sportspersons from eight structurally different sports in India.
Methods: A cross-sectional, descriptive-comparative survey design was used. A two-stage purposive-then-random sampling procedure yielded 400 retired male sportspersons representing Cricket, Football, Volleyball, Basketball, Track & Field, Badminton, Wrestling, and Judo, aged 40–50 years (M = 45.18, SD = 3.14), retired at least 10 years previously (M = 12.54, SD = 4.63). Data were obtained with the 40-item Lifestyle Assessment Inventory (LSAI), administered as a structured online form, and analysed in Python (SciPy, pandas, statsmodels) with cross-verification in IBM SPSS Statistics, using one-way ANOVA, Kruskal–Wallis H tests, eta-squared, and Tukey's HSD post-hoc comparisons.
Results: Achieved sample sizes ranged from 23 (Basketball) to 83 (Track & Field) rather than being evenly distributed, reflecting differential access to eligible retirees through federations, academies, and alumni networks rather than a balanced design. Sport groups did not differ significantly in physical fitness ($F(7,392) = 1.92$, $p = .066$, $\eta^2 = .033$) or nutrition ($F(7,392) = 1.63$, $p = .126$, $\eta^2 = .028$), but differed significantly in alcohol and drug habits ($F(7,392) = 2.65$, $p = .011$, $\eta^2 = .045$), spiritual wellness ($F(7,392) = 5.04$, $p < .001$, $\eta^2 = .083$), emotional wellness ($F(7,392) = 3.97$, $p < .001$, $\eta^2 = .066$), stress management ($F(7,392) = 3.70$, $p = .001$, $\eta^2 = .062$), intellectual wellness ($F(7,392) = 2.52$, $p = .015$, $\eta^2 = .043$), and, most substantially, the composite Overall Health-Related Lifestyle score ($F(7,392) = 13.51$, $p < .001$, $\eta^2 = .194$), a large effect. Volleyball and Track & Field retirees reported markedly lower composite scores than Cricket, Football, Badminton, Wrestling, and Judo retirees. Kruskal–Wallis tests corroborated these patterns. Internal consistency was acceptable for the 40-item composite ($\alpha = .86$) but inconsistent, and in three sub-scales negative, at the individual sub-scale level.
Conclusion: Contrary to a pure convergence hypothesis, health-related lifestyle after sports retirement in this Indian sample varied systematically by sport, particularly for psychosocial and behavioural dimensions and the composite index, while physical fitness and nutrition were comparatively uniform across sports. This pattern has direct implications for the design of sport-federation-specific, rather than generic, post-retirement support programming.....
Keywords: retired athletes, health-related lifestyle, career transition, wellness, health.

INTRODUCTION

Being a professional athlete is necessarily time-bound: the years of active, competitive participation, and the identity, daily routines, and physiological training that characterise athletes' lives, are usually over well before midlife, after which life takes place outside the structured, highly supported environments of elite competition (Wylleman & Lavallee, 2004). How strong or weak post-transition health-related habits are, and whether they change, persist, or deteriorate, is a question of considerable international interest that has not been examined in comparable detail in the Indian sporting context, where a large and growing population of retired professional sportspersons exists across multiple structurally distinct disciplines.

Research on retired-athlete health has grown substantially over the last decade internationally. Systematic evidence suggests that, overall, former athletes experience physical health outcomes broadly similar to (Filbay et al., 2019) and mental health outcomes somewhat better than (Filbay et al., 2019) the general population, yet several areas of concern have been identified: a reduction in physical activity after the end of the sports career (Filbay et al., 2018); nutritional habits that can drop below general-population levels once the structured dietary support of an active career is removed (Yao et al., 2020); and elevated cardiometabolic risk among athletes who become inactive after retirement (Alshaer et al., 2025). Alshaer et al. (2025) compared the health profiles of elite retired martial-arts athletes aged 40 to 50 years with non-elite counterparts and found that retirement attenuated, without eliminating, the health benefits of earlier sport participation, underscoring the importance of post-retirement lifestyle behaviour specifically, rather than career-era sporting achievement alone.

Another theoretical framework considers retirement as part of a series of athletic, psychological, psychosocial and vocational life stages – the resources, coping skills and identity formed during the earlier stages will determine the outcome of retirement. This view suggests that the resources that an athlete can carry into retirement are likely to be influenced by sport-specific factors (such as physiological demand, team versus individual sport, institutional support, and cultural status of sport) and that it, consequently, seems reasonable to assume that health-related lifestyle may, in turn, vary systematically by sport. The extent to which this theoretical expectation is met in the real world, however, has been only limitedly tested, with most studies examining one sport and/or comparing athletes against non-athletes, and not multiple sports in comparison, using a common multidimensional measure of lifestyle.

This void is made even more significant by the Indian sport policy and support in sports and institutions are largely geared towards active sport persons and not towards sport retirees. In India, there is a lack of comparative, empirical evidence on the health related lifestyle of retired sportspersons in physical, behavioural, social and psychological aspects, although there have been some efforts like Khelo India (Ministry of Youth Affairs and Sports, n.d.) and recently the Retired Sportsperson Empowerment Training programme and the Pandit Deendayal Upadhyay National Welfare Fund for Sportspersons (Press Information Bureau, 2025) to address the vocational and financial welfare of retired sportspersons. This lack limits the evidence that can be used by federations, welfare agencies and public-health providers to guide their post-retirement programming, which is currently driven more by assumption than evidence.

A related clinical and public-health literature documents specific risks of an unmanaged post-elite transition, including cardiometabolic deterioration among athletes who become sedentary after losing access to structured training, given that the cardioprotective benefits of elite sport appear to depend on continued physical activity rather than being permanently conferred by a competitive career alone. Psychological and social distress among retired elite athletes is not, on average, markedly higher than in the general population, but tends to cluster within specific sub-groups those with medical comorbidities, chronic pain, high injury burden, or low social support. This clustering pattern supports the practical relevance of a multidimensional, rather than single-indicator, approach of the kind adopted here, because a measure of physical activity alone would risk overlooking exactly the group-concentrated psychological or social risk that this broader literature identifies as clinically important.

1.1 Theoretical Framework

The present study's treatment of health-related lifestyle as multidimensional, rather than unitary, follows a wider shift in the health sciences away from a narrow biomedical conception of health (the absence of diagnosable disease) toward the WHO (1978) conception of health as a state of holistic well-being.

Superimposed on this multidimensional health perspective is the holistic athletic career model (Wylleman & Lavallee, 2004), which situates athletic retirement within a life course of interacting athletic, psychological, psychosocial, academic/vocational, financial, and legal transitions, rather than treating it as an isolated occupational event. This synthesis of the two models yields two theoretically defensible, competing predictions. On one hand, the holistic model's emphasis on carried-forward resources and identity structures suggests that post-retirement health-related lifestyle could differ systematically between sports, given that sports differ in physiological demand, team structure, competitive culture, and institutional support during the athlete's playing career.

1.2 Objectives

To assess and compare Physical Fitness among retired professional sportspersons of different sports.
To assess and compare Alcohol and Drug Habits among retired professional sportspersons of different sports.
To assess and compare Nutritional practices among retired professional sportspersons of different sports.
To assess and compare Social Wellness among retired professional sportspersons of different sports.
To assess and compare Spiritual Wellness among retired professional sportspersons of different sports.
To assess and compare Emotional Wellness among retired professional sportspersons of different sports.
To assess and compare Stress Management among retired professional sportspersons of different sports.
To assess and compare Intellectual Wellness among retired professional sportspersons of different sports.
To compute a composite Overall Health-Related Lifestyle score for each participant and compare it among retired professional sportspersons of different sports.

2. MATERIALS AND METHODS

2.1 Research Design

The study adopted a mixed and descriptive-comparative survey design. Health-related lifestyle was measured at a single time point across eight pre-existing groups defined by the sport played during an already-completed professional career; the design is therefore ex-post facto rather than experimental, since sport was not, and could not be, manipulated. This design was judged appropriate given the clearly comparative aim of the study (Section 1.3) and the need to obtain a large, geographically dispersed sample of a relatively rare population within a feasible period. As with any cross-sectional design, causal claims about the direction of influence between sport and lifestyle cannot be made from these data alone; this constraint is addressed directly in Section 5.

2.2 Participants

The analytic sample comprised 400 retired professional male sportspersons from eight sports: Cricket, Football, Volleyball, Basketball, Track & Field, Badminton, Wrestling, and Judo. All participants were aged 40–50 years ($M = 45.18$, $SD = 3.14$), had played competitively for an average of 14.97 years ($SD = 3.16$), and had retired from competitive sport at least 10 years before data collection (M years since retirement = 12.54, $SD = 4.63$).

The number of participants in each sport was not equally allocated as originally planned and varied between 23 participants (Basketball) and 83 participants (Track & Field) because it was dictated by the accessibility of the verified eligible retirees in each sport through their federations, academies and alumni networks which served as the sampling frames (Section 2.3).

2.3 Inclusion criteria

Male gender; age 40-50 years; prior competitive participation at a professional or seriously competitive level in one of the eight selected sports; and at least 10 years since the last competitive event. Exclusion criteria were female gender; recent (< 10 years) or currently active competitive status; age outside the 40-50-year range; competitive history in a sport other than one of the eight selected disciplines.

2.4 Sampling

A two-stage sampling technique combining purposive and random selection was adopted. In the first stage, sport-specific sampling frames were purposively developed using national and state-level sports federations, recognised academies, and alumni/former-players' associations for each of the eight sports, since eligible individuals could be verified against the study's criteria only through these bodies. In the second stage, eligible individuals within each sport-specific frame were selected by simple random sampling. This two-stage procedure reflects the impracticality of a fully randomised national sampling frame for this difficult-to-enumerate population, while still applying a defensible, bias-reducing selection method within each frame. As noted above, this stage-one purposive

step is also the most plausible source of the unequal achieved sample sizes across sports, since federation, academy, and alumni-network coverage and record-keeping quality are known to vary across Indian sports.

2.5 Research Tool

Health-related lifestyle was assessed with the Lifestyle Assessment Inventory (LSAI), a self-report, 40-item, eight-sub-scale measure preceded by a demographic and sport-classification section (age, sport, education level, post-retirement occupation, years played, years since retirement). The instrument was administered electronically through a structured online form, enabling standardised data collection from a geographically distributed sample.

2.6 Reliability

To assess internal-consistency reliability across the full analytic sample (N = 400) Cronbach's alpha was used for each of the eight sub-scales and for the 40-item composite score. The composite score showed an acceptable level of internal consistency (α = .86), exceeding the generally accepted .70 threshold. Sub-scale-level reliability was considerably less consistent: Physical Fitness α = .35; Alcohol and Drug Habits α = .49; Nutrition α = −.19; Social Wellness α = .57; Spiritual Wellness α = −.11; Emotional Wellness α = −.15; Stress Management α = .44; Intellectual Wellness α = .45.

2.7 Validity

The eight-dimension structure of the LSAI has face and content validity, in that its items correspond to a multidimensional model of wellness encompassing physical, behavioural, social, and psychological aspects of health, consistent with the WHO definition adopted in Section 1.1, and the item wording and dimensional relevance were reviewed by subject-matter experts and pilot-tested with the target retired-sportsperson population prior to full-scale administration. Empirically, construct validity is supported by the acceptable internal consistency of the composite score (Section 2.5), and criterion validity was explored by benchmarking the distribution of composite scores against normative ranges reported in comparable fitness/lifestyle assessment literature.

2.8 Ethics

The study was performed in an ethically responsible manner with human subjects. Research ethics clearance from the institution was obtained prior to contacting participants. Participants gave informed consent after being informed about the purpose of the study.

2.9 Data Collection Procedure

Data collection involved the following steps: institutional ethics clearance and federation/academy permission; personal contact by the data collection team with eligible, randomly selected participants; provision of study information and informed consent; filling out the LSAI questionnaire using a structured online form; time-stamped automatic data collection; checking for completed forms by the data collection team for completeness and valid sport classification; and the secure storage of the completed forms in a password-protected master analysis file that was accessible to only the data collection team. Data-quality checks comprised: range checks (confirming that all Likert-item responses fell within the valid 1–5 range); completeness checks (flagging records with a large proportion of missing items); a straight-lining check (flagging records with an identical value across all 40 items as potentially non-serious responses); and consistency checks (re-computing sub-scale totals from item-level scores and comparing them against the recorded totals). No duplicate participant records were identified in the final 400-case file.

2.10 Statistical Analysis

Data were analysed using Python (SciPy and pandas for descriptive and inferential statistics; statsmodels for post-hoc comparisons) and cross-checked using IBM SPSS Statistics. Descriptive statistics (mean and standard deviation) were computed for each of the nine dependent variables, the eight LSAI sub-scales and the composite Overall Health-Related Lifestyle score for the total sample and separately for each of the eight sports.

Prior to inferential analysis, the distributional characteristics of each dependent variable were examined within each sport group using the Shapiro–Wilk test of normality, and homogeneity of variance across the eight sport groups was assessed using Levene's test for each dependent variable. Because the study compared eight independent sport groups, one-way between-groups analysis of variance (ANOVA) was used to test differences in mean scores on the nine dependent variables, with Sport as the independent variable (eight levels; df = 7, 392 for every ANOVA).

The nine null hypotheses (H01–H09) were each tested at $\alpha = .05$. Eta-squared (η^2) was calculated as the effect-size measure for each ANOVA, with values of approximately .01, .06, and .14 conventionally interpreted as small, medium, and large effects, respectively (Cohen, 1988).

Because the Shapiro–Wilk tests indicated that the normality assumption was not consistently satisfied across sport-by-dimension combinations (Section 3, Table 3), a non-parametric Kruskal–Wallis H test (df = 7) was additionally conducted for every dependent variable as a distribution-free robustness check of the ANOVA findings. ANOVA and Kruskal–Wallis results were interpreted jointly; where the two tests diverged in statistical significance for the same dependent variable, this divergence is reported and discussed explicitly (Section 3, Section 4) rather than resolved by selectively reporting only the more favourable test.

Where an omnibus ANOVA reached statistical significance, Tukey's Honestly Significant Difference (HSD) post-hoc test was used to identify which specific pairs of sports contributed to the overall difference; because Tukey's HSD does not require equal group sizes, it remained an appropriate post-hoc procedure despite the unequal achieved sample sizes noted in Section 2.2. Post-hoc comparisons were interpreted only for dependent variables whose omnibus ANOVA was statistically significant at $\alpha = .05$.

All tests were two-tailed. Results are reported with the F statistic, degrees of freedom, p value, and η^2 for each ANOVA, and with the Kruskal–Wallis H statistic and corresponding p value for each non-parametric test, following APA (7th ed.) statistical-reporting conventions.

3. RESULTS

Descriptive, assumption-check, and inferential results are presented in Tables 1–5 and interpreted below. Contrary to the pattern anticipated at the design stage (Section 1.1), the eight sport groups did not converge uniformly on the nine dependent variables: physical fitness and nutrition showed no statistically significant sport differences, but the remaining six dependent variables alcohol and drug habits, spiritual wellness, emotional wellness, stress management, intellectual wellness, and, most substantially, the composite Overall Health-Related Lifestyle score differed significantly by sport. This section reports these findings table by table; their theoretical and practical interpretation follows in Section 4.

Table 1 shows the descriptions of the demographic and career characteristics of retired professional sportspersons in eight different sports. The study involved 400 participants with the maximum number of participants being from Track & Field (n = 83) and the minimum being from Basketball (n = 23), followed by Volleyball (n = 68), Judo (n = 56), Cricket (n = 55), Badminton (n = 42), Football (n = 40), Wrestling (n = 33).

The participants' mean age was 45.18 years (SD = 3.14). Among the sports, wrestling players had the highest mean age (45.82 ± 3.19 years), followed by Badminton (45.48 ± 3.03 years) and Track & Field (45.40 ± 3.02 years). Football players had the lowest mean age (44.58 ± 3.43 years), and Volleyball players had a relatively low mean age (44.84 ± 3.11 years). The other sports had meant ages of 45.09 to 45.21 years, which were not significantly different among sports.

When considering the amount of playing experience, the overall mean was 14.97 years (SD = 3.16). Basketball players reported the highest mean playing experience (15.48 ± 3.25 years), followed by Volleyball (15.25 ± 3.23 years), Badminton (15.12 ± 3.08 years), and Wrestling (15.09 ± 3.13 years). The shortest mean playing experience was that of Football (14.55 ± 3.11 years), and the other sports (Cricket, Judo and Track & Field) had similar means to each other (14.78 ± 3.16 years), (14.80 ± 3.21 years) and (14.90 ± 3.18 years) respectively.

The mean length of time since retirement for the whole group was 12.54 years (SD = 4.63). Football players had the longest mean time of retirement (13.78 ± 4.45 years), followed by Wrestling (13.76 ± 4.69 years) and Cricket (13.35 ± 4.60 years). Volleyball players, on the other hand, had the least average retirement age (11.54 ± 4.40 years) and Badminton had a shorter mean retirement age (11.64 ± 4.63 years). Basketball (12.57 ± 5.03 years), Track & Field (12.45 ± 4.50 years), and Judo (12.20 ± 4.87 years) exhibited intermediate values.

Table 1. Demographic and Career Characteristics by Sport

Sport	n	Age M (SD)	Years Played M (SD)	Years Since Retirement M (SD)
Cricket	55	45.09 (3.20)	14.78 (3.16)	13.35 (4.60)
Football	40	44.58 (3.43)	14.55 (3.11)	13.78 (4.45)
Volleyball	68	44.84 (3.11)	15.25 (3.23)	11.54 (4.40)

Basketball	23	45.17 (2.84)	15.48 (3.25)	12.57 (5.03)
Track & Field	83	45.40 (3.02)	14.90 (3.18)	12.45 (4.50)
Badminton	42	45.48 (3.03)	15.12 (3.08)	11.64 (4.63)
Wrestling	33	45.82 (3.19)	15.09 (3.13)	13.76 (4.69)
Judo	56	45.21 (3.30)	14.80 (3.21)	12.20 (4.87)
Total sample	400	45.18 (3.14)	14.97 (3.16)	12.54 (4.63)

Figure 1 shows the mean age, mean years of professional playing experience and mean years since retirement of retired professional sportspersons, by sport discipline. The graphical presentation shows that the age of the participants was very consistent among all sports, with a minimum mean of 44.58 years (Football) and a maximum mean of 45.82 years (Wrestling). There was also little inter-sport difference in the number of years of professional playing experience, with Basketball players having the highest (15.48 years) and Football players the lowest (14.55 years) mean number of years. Modest differences in number of years since retirement were observed between sports, ranging from 11.54 years for Volleyball to 13.78 years for Football. Error bars (±SD) indicate that there is considerable overlap for each variable between all sports, showing that the various sports disciplines had similar demographic and career characteristics. In general, the graphic trends suggest that the age, playing career, and retired years were similar for the retired professional athletes studied.

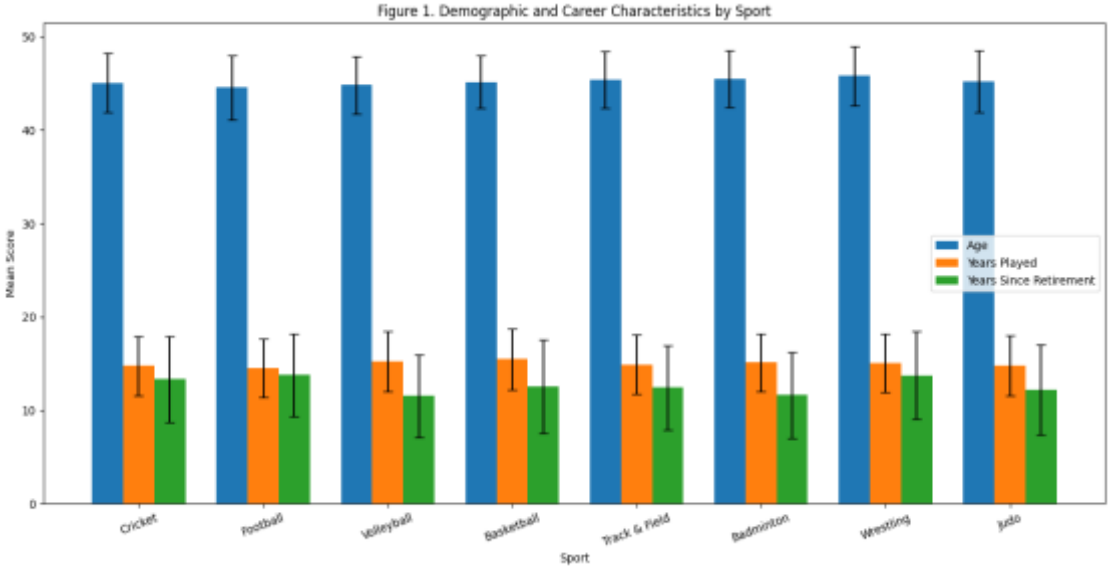

Figure 1 The graphical presentation of the (Mean ± SD) age, years of professional playing experience, and years since retirement among retired professional sportspersons across eight sports disciplines.

Table 2 presents descriptive statistics for each of the nine dependent variables by sport.

Sport	Physical Fitness	Alcohol & Drug Habits	Nutrition	Social Wellness	Spiritual Wellness	Emotional Wellness	Stress Management	Intellectual Wellness	Composite HRL
Cricket	18.91 (1.62)	18.78 (1.65)	18.69 (1.80)	18.45 (1.77)	19.20 (1.53)	18.93 (1.63)	19.45 (1.61)	18.87 (1.62)	151.29 (5.02)
Football	18.75 (2.08)	18.15 (1.67)	18.85 (1.92)	18.52 (1.99)	17.98 (1.73)	18.42 (1.75)	18.18 (1.53)	18.38 (1.72)	147.22 (4.69)
Volleyball	18.04 (1.65)	18.15 (1.81)	18.24 (1.83)	18.07 (1.45)	18.07 (1.43)	17.74 (1.68)	18.22 (1.73)	17.96 (1.68)	144.49 (5.28)
Basketball	18.52 (1.16)	18.65 (1.43)	18.96 (1.99)	19.04 (1.49)	18.35 (1.37)	18.91 (1.76)	18.22 (1.48)	19.13 (1.94)	149.78 (3.73)

Track & Field	18.83 (1.78)	18.98 (1.58)	18.81 (1.71)	18.58 (1.62)	18.95 (1.63)	19.07 (1.67)	18.93 (1.77)	18.90 (1.85)	151.05 (4.58)
Badminton	18.38 (1.67)	18.10 (1.87)	18.29 (1.64)	18.62 (1.92)	17.95 (1.40)	18.55 (1.60)	18.48 (1.73)	18.43 (1.67)	146.79 (5.40)
Wrestling	18.18 (1.72)	18.12 (1.62)	19.21 (1.47)	17.94 (1.46)	18.18 (1.61)	18.76 (1.73)	18.76 (1.41)	18.36 (1.65)	147.52 (4.16)
Judo	18.64 (1.60)	18.64 (1.37)	18.82 (1.62)	18.73 (1.63)	18.79 (1.81)	18.52 (1.81)	18.82 (1.62)	18.34 (1.75)	149.30 (5.88)
Total	18.56 (1.71)	18.50 (1.66)	18.69 (1.75)	18.47 (1.68)	18.51 (1.64)	18.59 (1.74)	18.69 (1.69)	18.53 (1.76)	148.53 (5.51)

Table 2 presents the descriptive statistics (Mean ± SD) of the eight dimensions of Health-Related Lifestyle (HRL) and the Composite HRL score among retired professional sportspersons across eight sports disciplines.

For the Physical Fitness dimension, Cricket players recorded the highest mean score (18.91 ± 1.62), followed by Track & Field (18.83 ± 1.78), Football (18.75 ± 2.08), Judo (18.64 ± 1.60), Basketball (18.52 ± 1.16), Badminton (18.38 ± 1.67), Wrestling (18.18 ± 1.72), and Volleyball (18.04 ± 1.65), which reported the lowest mean score. The overall mean Physical Fitness score for the total sample was 18.56 ± 1.71.

For the Alcohol & Drug Habits dimension, Track & Field athletes recorded the highest mean score (18.98 ± 1.58), followed by Cricket (18.78 ± 1.65), Basketball (18.65 ± 1.43), Judo (18.64 ± 1.37), Football (18.15 ± 1.67) and Volleyball (18.15 ± 1.81), Wrestling (18.12 ± 1.62), and Badminton (18.10 ± 1.87), which reported the lowest mean score. The overall mean Alcohol & Drug Habits score for the total sample was 18.50 ± 1.66.

For the Nutrition dimension, wrestling players recorded the highest mean score (19.21 ± 1.47), followed by Basketball (18.96 ± 1.99), Football (18.85 ± 1.92), Judo (18.82 ± 1.62), Track & Field (18.81 ± 1.71), Cricket (18.69 ± 1.80), Badminton (18.29 ± 1.64), and Volleyball (18.24 ± 1.83), which reported the lowest mean score. The overall mean Nutrition score for the total sample was 18.69 ± 1.75.

For the Social Wellness dimension, Basketball players recorded the highest mean score (19.04 ± 1.49), followed by Judo (18.73 ± 1.63), Badminton (18.62 ± 1.92), Track & Field (18.58 ± 1.62), Football (18.52 ± 1.99), Cricket (18.45 ± 1.77), Volleyball (18.07 ± 1.45), and Wrestling (17.94 ± 1.46), which reported the lowest mean score. The overall mean Social Wellness score for the total sample was 18.47 ± 1.68.

For the Spiritual Wellness dimension, Cricket players recorded the highest mean score (19.20 ± 1.53), followed by Track & Field (18.95 ± 1.63), Judo (18.79 ± 1.81), Basketball (18.35 ± 1.37), Wrestling (18.18 ± 1.61), Volleyball (18.07 ± 1.43), Football (17.98 ± 1.73), and Badminton (17.95 ± 1.40), which reported the lowest mean score. The overall mean Spiritual Wellness score for the total sample was 18.51 ± 1.64.

For the Emotional Wellness dimension, Track & Field athletes recorded the highest mean score (19.07 ± 1.67), followed by Cricket (18.93 ± 1.63), Basketball (18.91 ± 1.76), Wrestling (18.76 ± 1.73), Badminton (18.55 ± 1.60), Judo (18.52 ± 1.81), Football (18.42 ± 1.75), and Volleyball (17.74 ± 1.68), which reported the lowest mean score. The overall mean Emotional Wellness score for the total sample was 18.59 ± 1.74.

For the Stress Management dimension, Cricket players recorded the highest mean score (19.45 ± 1.61), followed by Track & Field (18.93 ± 1.77), Judo (18.82 ± 1.62), Wrestling (18.76 ± 1.41), Badminton (18.48 ± 1.73), Basketball (18.22 ± 1.48) and Volleyball (18.22 ± 1.73), while Football (18.18 ± 1.53) reported the lowest mean score. The overall mean Stress Management score for the total sample was 18.69 ± 1.69.

For the Intellectual Wellness dimension, Basketball players recorded the highest mean score (19.13 ± 1.94), followed by Track & Field (18.90 ± 1.85), Cricket (18.87 ± 1.62), Badminton (18.43 ± 1.67), Football (18.38 ± 1.72), Wrestling (18.36 ± 1.65), Judo (18.34 ± 1.75), and Volleyball (17.96 ± 1.68), which reported the lowest mean score. The overall mean Intellectual Wellness score for the total sample was 18.53 ± 1.76.

For the Composite Health-Related Lifestyle (HRL) score, Cricket players recorded the highest mean score (151.29 ± 5.02), followed by Track & Field (151.05 ± 4.58), Basketball (149.78 ± 3.73), Judo (149.30 ± 5.88), Wrestling (147.52 ± 4.16), Football (147.22 ± 4.69), Badminton (146.79 ± 5.40), and Volleyball (144.49 ± 5.28), which reported the lowest composite HRL score. The overall mean Composite HRL score for the total sample was 148.53 ± 5.51.

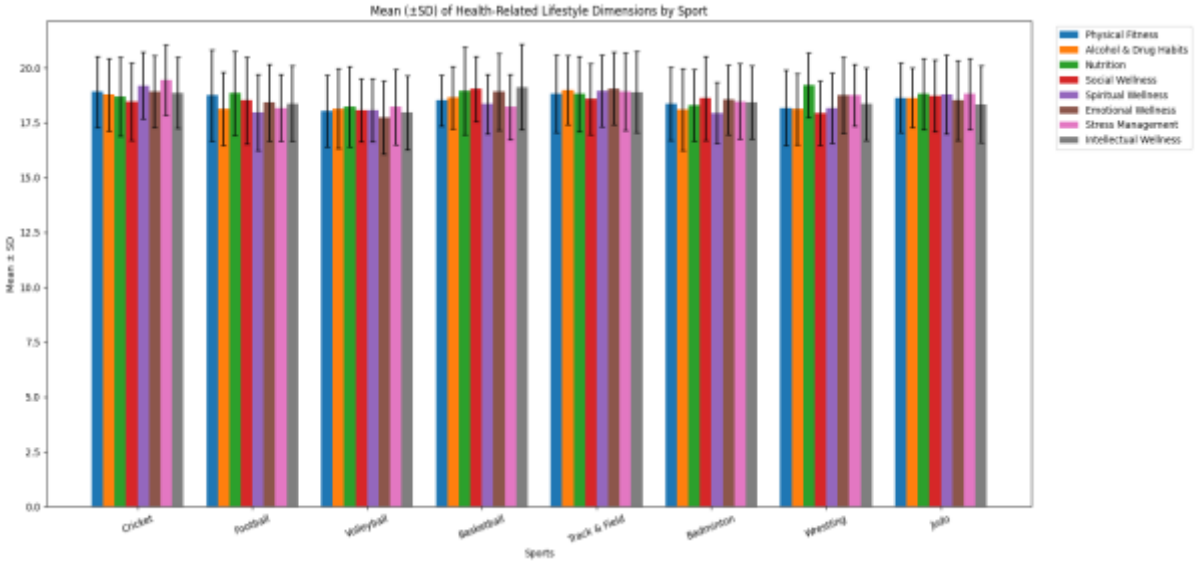

Figure 2 Graphical Representation of Physical Fitness, Spiritual Wellness, Emotional Wellness, Alcohol & Drug Habits, Emotional Wellness, Social Wellness, Intellectual Wellness and Stress Management dimensions of retired professional sportspersons from eight different sport disciplines (Mean ± SD).

Figure 2 shows the mean (± SD) scores for each of the eight dimensions of the Health-Related Lifestyle (HRL) for retired professional sportspersons, by sport discipline. In general, the graphical display suggests that the mean scores for each HRL dimension were not widely dispersed across the various sports and were mostly within the range from 18 to 19 points. The Track & Field athletes had relatively higher scores on Alcohol & Drug Habits and Emotional Wellness, whereas the Cricket players had relatively higher scores on Physical Fitness, Spiritual Wellness, Emotional Wellness and Stress Management. In Social Wellness and Intellectual Wellness, the highest mean scores were posted by the Basketball players with the highest mean score in Nutrition by the Wrestling players. Volleyball players, on the other hand, were more likely to have relatively low scores on a number of HRL factors, especially in Physical Fitness, Emotional Wellness and Intellectual Wellness.

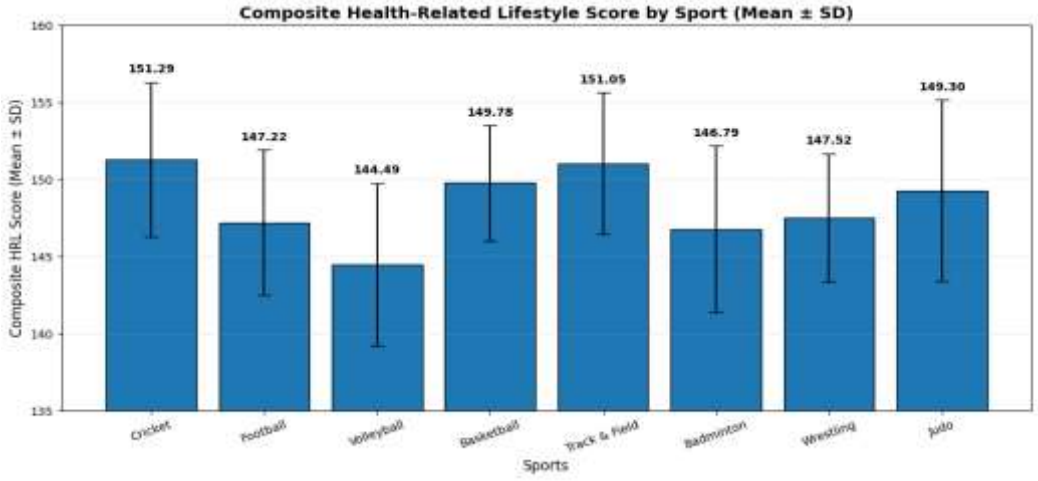

Figure 3 The graphical presentation of the (Mean ± SD) Composite Health-Related Lifestyle (HRL) among retired professional sportspersons across eight sports disciplines.

Figure 3 shows the Composite Health-Related Lifestyle (HRL) Score (Mean ± SD) of retired professional sportspersons in eight sports. Of the sports, Cricket had the highest composite HRL score (151.29 ± 5.02) followed closely by Track & Field (151.05 ± 4.58). Basketball (149.78 ± 3.73) and Judo (149.30 ± 5.88) also showed relatively higher composite scores than the other sports. Wrestling (147.52 ± 4.16), Football (147.22 ± 4.69), and Badminton (146.79 ± 5.40) exhibited intermediate mean composite scores, whereas Volleyball players recorded

the lowest composite HRL score (144.49 ± 5.28). There was moderate variation within each sport (represented by the error bars ±SD) and some overlap of the results between all groups, suggesting that retired professional sportspersons in the eight sports groups had relatively similar composite health-related lifestyle scores.

The results of normality assessment, homogeneity of variance, one-way ANOVA, effect size (η^2), and Kruskal–Wallis test for each DV in each sport discipline are presented in Table 3.

Four of the groups were not normally distributed on the Physical Fitness dimension. The results of Levene's test were not significant ($F(7,392) = 1.30$, $p = .247$), which means that the assumption of homogeneity of variance was met. The one-way ANOVA showed that there was no statistically significant difference between the sports groups ($F(7,392) = 1.92$, $p = .066$, $\eta^2 = .033$). Likewise, Kruskal–Wallis test was not statistically significant ($H(7) = 12.32$, $p = .091$) and that no significant differences existed in Physical Fitness across the sports disciplines.

Six groups had a non-normal distribution for Alcohol & Drug Habits. Levene's test indicated homogeneity of variance ($F(7,392) = 1.25$, $p = .273$). Results showed that there was a statistically significant difference between the sports groups ($F(7,392) = 2.65$, $p = .011$) with a small effect size ($\eta^2 = .045$). The Kruskal–Wallis test also showed a statistically significant difference ($H(7) = 17.17$, $p = .016$), which validated the results of the ANOVA.

6 groups were identified as non-normal in the Nutrition dimension. Levene's test confirmed homogeneity of variance ($F(7,392) = 0.51$, $p = .830$). The one-way ANOVA revealed that there was no statistically significant difference between the sports disciplines ($F(7,392) = 1.63$, $p = .126$) and the effect size was small ($\eta^2 = .028$). Similarly, the Kruskal–Wallis test was non-significant ($H(7) = 11.77$, $p = .108$), indicating that there were no significant differences between the sports groups with respect to Nutrition score.

Five groups were identified as not being normally distributed for Social Wellness. Levene's test was not significant ($F(7,392) = 1.02$, $p = .417$), and this test indicated that the variances of the groups were equal. By the one-way ANOVA there was no statistically significant difference ($F(7,392) = 1.71$, $p = .106$), but with Kruskal–Wallis test there was statistically significant difference ($H(7) = 14.13$, $p = .049$). The effect size computed by ANOVA was small ($\eta^2 = .030$).

Six of the groups showed non-normal distribution for the Spiritual Wellness dimension. Levene's test confirmed homogeneity of variance ($F(7,392) = 1.20$, $p = .303$). The one-way ANOVA showed a highly statistically significant difference between the sports groups ($F(7,392) = 5.04$, $p < .001$) with a moderate effect size ($\eta^2 = .083$). This was confirmed by the Kruskal–Wallis test which also showed a highly significant difference ($H(7) = 32.35$, $p < .001$).

Six groups were found to be non-normally distributed for Emotional Wellness. The homogeneity assumption was met because Levene's test was not significant ($F(7,392) = 0.30$, $p = .956$). The one-way ANOVA revealed that there was a statistically significant difference between the sports disciplines ($F(7,392) = 3.97$, $p < .001$) and that the strength of this difference was moderate ($\eta^2 = .066$). Results from the Kruskal–Wallis test were similar ($H(7) = 24.94$, $p = .001$), and significant differences were found among the groups.

Five groups were found to have non-normal distributions for Stress Management. Levene's test showed homogeneity of variance ($F(7,392) = 0.48$, $p = .848$). The one-way ANOVA revealed that there was a significant difference between the sports groups ($F(7,392) = 3.70$, $p = .001$, $\eta^2 = .062$). Results obtained from the Kruskal–Wallis test also showed that there was a statistically significant difference ($H(7) = 23.59$, $p = .001$) that confirmed the results of the ANOVA.

Only two groups were not normally distributed for the Intellectual Wellness dimension. Levene's test confirmed equal variances ($F(7,392) = 0.20$, $p = .986$). The one-way ANOVA showed a statistically significant difference between sports disciplines ($F(7,392) = 2.52$, $p = .015$, and $\eta^2 = .043$) and a small effect size. The Kruskal–Wallis test also showed a statistically significant difference ($H(7) = 17.18$, $p = .016$), which is in line with the ANOVA results.

Only two groups were non-normal for the Composite Overall Health-Related Lifestyle (HRL) score. Levene's test was used to check the assumption of homogeneity of variance, which was met ($F(7,392) = 0.88$, $p = .524$). One-way ANOVA revealed that the sports disciplines differed significantly in terms of the highly statistically significant F value ($F(7,392) = 13.51$, $p < .001$, $\eta^2 = .194$), which represented the largest effect-size of the study. The Kruskal–Wallis test also indicated a highly significant difference ($H(7) = 77.16$, $p < .001$) which confirmed statistical results obtained from parametric and non-parametric methods.

Table 3. Normality, Homogeneity of Variance, One-Way ANOVA, and Kruskal-Wallis Results by Dependent Variable

Dependent Variable	Non-normal groups	Levene F(7,392)	Levene p	ANOVA F(7,392)	ANOVA p	η^2	Kruskal-Wallis H(7)	KW p
Physical Fitness	4	1.30	.247	1.92	.066	.033	12.32	.091
Alcohol & Drug Habits	6	1.25	.273	2.65	.011*	.045	17.17	.016*
Nutrition	6	0.51	.830	1.63	.126	.028	11.77	.108
Social Wellness	5	1.02	.417	1.71	.106	.030	14.13	.049*
Spiritual Wellness	6	1.20	.303	5.04	<.001*	.083	32.35	<.001*
Emotional Wellness	6	0.30	.956	3.97	<.001*	.066	24.94	.001*
Stress Management	5	0.48	.848	3.70	.001*	.062	23.59	.001*
Intellectual Wellness	2	0.20	.986	2.52	.015*	.043	17.18	.016*
Composite Overall HRL	2	0.88	.524	13.51	<.001*	.194	77.16	<.001*

The statistical significant results of the Tukey HSD post hoc test for one-way ANOVA are shown in Table 4.
Only one pairwise difference was found to be statistically significant for the Alcohol & Drug Habits dimension. The mean score of Track & Field athletes was significantly higher than the mean score of Volleyball athletes, $p = .044$, mean difference of .83.
Multiple statistically significant pairwise differences were found in the Spiritual Wellness dimension. Cricket players scored significantly more than Badminton players (Mean Difference = 1.25, $p = .004$), Football players (Mean Difference = 1.23, $p = .005$) and Volleyball players (Mean Difference = 1.13, $p = .003$). Likewise, the score on Spiritual Wellness for the Track & Field athletes was significantly higher than the score of Badminton players (Mean Difference = 1.00, $p = .021$), Football players (Mean Difference = 0.98, $p = .031$), and Volleyball players (Mean Difference = 0.88, $p = .017$).
Cricket players did have scores that were significantly higher than Volleyball players on the Emotional Wellness dimension (Mean Difference = 1.19, $p = .003$). Similarly, the Track & Field athletes scored significantly higher than Volleyball players on Emotional Wellness (Mean Difference = 1.34, $p < .001$).
Within the Stress Management dimension, the Cricket players had significantly higher scores than the Football players (Mean Difference = 1.28, $p = .005$) and the Volleyball players (Mean Difference = 1.23, $p = .001$).
For the Intellectual Wellness dimension, the mean score difference between the Track & Field athletes and the Volleyball players was 0.95 ($p = .020$) and the Track & Field athletes had higher scores compared to the Volleyball players.
The Composite Overall Health-Related Lifestyle (HRL) score showed the largest number of statistically significant pairwise comparisons. Cricket players recorded significantly higher composite HRL scores than Badminton (Mean Difference = 4.51, $p = .0004$), Football (Mean Difference = 4.07, $p = .003$), Volleyball (Mean Difference = 6.81, $p < .001$), and Wrestling (Mean Difference = 3.78, $p = .015$) players. Track & Field athletes also demonstrated significantly higher composite HRL scores than Badminton (Mean Difference = 4.26, $p = .0002$), Football (Mean Difference = 3.82, $p = .002$), Volleyball (Mean Difference = 6.56, $p < .001$), and Wrestling (Mean Difference = 3.53, $p = .015$) players. In addition, Basketball players achieved significantly higher composite HRL scores than Volleyball players (Mean Difference = 5.30, $p = .0004$), while Judo players also recorded significantly higher composite HRL scores than Volleyball players (Mean Difference = 4.82, $p < .001$).

Table 4. Statistically Significant Tukey HSD Pairwise Comparisons

Dependent Variable	Comparison	Mean Difference	p
Alcohol & Drug Habits	Track & Field > Volleyball	0.83	.044
Spiritual Wellness	Cricket > Badminton	1.25	.004
Spiritual Wellness	Track & Field > Badminton	1.00	.021
Spiritual Wellness	Cricket > Football	1.23	.005
Spiritual Wellness	Cricket > Volleyball	1.13	.003
Spiritual Wellness	Track & Field > Football	0.98	.031
Spiritual Wellness	Track & Field > Volleyball	0.88	.017
Emotional Wellness	Cricket > Volleyball	1.19	.003
Emotional Wellness	Track & Field > Volleyball	1.34	<.001
Stress Management	Cricket > Football	1.28	.005
Stress Management	Cricket > Volleyball	1.23	.001
Intellectual Wellness	Track & Field > Volleyball	0.95	.020
Composite Overall HRL	Cricket > Badminton	4.51	.0004
Composite Overall HRL	Track & Field > Badminton	4.26	.0002
Composite Overall HRL	Basketball > Volleyball	5.30	.0004
Composite Overall HRL	Cricket > Football	4.07	.003
Composite Overall HRL	Cricket > Volleyball	6.81	<.001
Composite Overall HRL	Cricket > Wrestling	3.78	.015
Composite Overall HRL	Track & Field > Football	3.82	.002
Composite Overall HRL	Judo > Volleyball	4.82	<.001
Composite Overall HRL	Track & Field > Volleyball	6.56	<.001
Composite Overall HRL	Track & Field > Wrestling	3.53	.015

The Cronbach's alpha coefficient was used to determine the internal consistency reliability of the Health-Related Lifestyle (HRL) scale and its sub-scales as shown in Table 5. The eight sub scales each had 5 items and the Composite Overall HRL scale had 40.

The Cronbach's alpha coefficient for Physical Fitness sub-scale was 0.35 (5 items). The Alcohol & Drug Habits sub-scale (also 5 items) had a Cronbach's alpha of 0.49. The Cronbach's alpha value of the Nutrition sub-scale was −0.19 and the Social Wellness sub-scale was 0.57.

The Cronbach's alpha for the Spiritual Wellness sub-scale was −0.11 while the Emotional Wellness sub-scale had a score of −0.15. Each sub-scale has five items, and the Stress Management sub-scale has a Cronbach's alpha coefficient of 0.44 and the Intellectual Wellness sub-scale has a coefficient of 0.45.

A 40-item Composite Overall Health-Related Lifestyle (HRL) scale showed the highest level of internal consistency reliability (Cronbach's alpha coefficient = 0.86) compared to the internal consistency reliability of the individual sub-scales.

Table 5. Internal Consistency Reliability (Cronbach's Alpha) by Scale

Scale / Sub-scale	Items	Cronbach's α
Physical Fitness	5	.35
Alcohol & Drug Habits	5	.49
Nutrition	5	−.19
Social Wellness	5	.57
Spiritual Wellness	5	−.11
Emotional Wellness	5	−.15
Stress Management	5	.44
Intellectual Wellness	5	.45
Composite Overall HRL	40	.86

4. DISCUSSION

4.1 Divergence, Not Convergence, Across Most Dimensions

The theoretical framework outlined in Section 1.1 set out two competing predictions: that carried-forward, sport-specific resources and institutional differences would produce divergence in post-retirement health-related lifestyle across sports, or that the shared adjustment demands of retirement itself would produce convergence. The present data supports neither prediction in its pure form. Physical fitness and nutrition arguably the two dimensions most directly tied to an individual's current daily behaviour rather than to career-era identity or institutional legacy converged across sports, with only small, non-significant differences (η^2 = .028–.033). In contrast, the more psychosocial and behavioural dimensions, and especially the composite score that aggregates all eight dimensions, diverged significantly by sport, with the composite effect (η^j = .194) reaching a magnitude conventionally described as large (Cohen, 1988) and roughly six times the size of the effect for physical fitness.

This dimension-specific pattern is, on reflection, consistent with the holistic athletic career model rather than contradicting it, once the model's emphasis on carried-forward psychosocial and identity-related resources, as distinct from current physical behaviour, is taken seriously. Physical fitness and nutrition are dimensions that most retirees can, in principle, actively maintain or rebuild through their own present-day choices regardless of which sport they formerly played, which may explain why sport of origin ceased to differentiate these two dimensions roughly 12–13 years into retirement on average. Spiritual wellness, emotional wellness, stress management, and intellectual wellness, by contrast, plausibly depend more heavily on the identity structures, social networks, and coping repertoires an athlete carried into and through their competitive career resources that differ systematically by the team culture, institutional support, and career trajectory characteristic of a given sport, and that appear, on this evidence, not to fully equalise even a decade or more after retirement.

4.2 The Cricket and Track & Field Advantage, and the Volleyball Shortfall

The specific pattern of significant pairwise differences (Table 4) are informative beyond the omnibus tests. Cricket and Track & Field retirees consistently occupied the upper end of the composite distribution and were significantly higher than Volleyball retirees on the composite score and on several individual dimensions (alcohol and drug habits, emotional wellness, and intellectual wellness for Track & Field; emotional wellness and stress management for Cricket). Cricket's position is broadly consistent with its status as India's most commercially professionalised sport (Section 1): the Indian Premier League era has been accompanied by substantially greater media visibility, sponsorship, alumni-network activity, and structured post-career opportunity (commentary, coaching, franchise, and media roles) than is typically available to retirees of the six Olympic disciplines studied here, which could plausibly translate into stronger post-retirement social and psychological resources even though it would not obviously explain physical fitness or nutrition, consistent with those two dimensions showing no sport effect.

Track & Field's comparably strong position is less immediately explained by commercial professionalisation, since it is institutionally supported chiefly through the Sports Authority of India rather than through independent commercial revenue (Section 1). A plausible behavioural explanation is that individual, endurance- and technique-based athletic disciplines cultivate self-regulated training habits, goal-setting skills, and an internalised locus of control that transfer relatively directly into post-retirement stress management, emotional regulation, and intellectual engagement, independent of the sport's commercial or institutional status; this interpretation is consistent with sport-psychology literature linking individual-sport backgrounds to self-directed coping strategies, though it remains a plausible rather than directly tested explanation within the present cross-sectional design.

Volleyball retirees' comparatively low scores on the composite measure and on several individual dimensions are harder to explain from institutional status alone, since Volleyball shares a broadly similar Sports-Authority-mediated institutional structure with several of the other Olympic sports in this sample that did not show the same shortfall (e.g., Judo, Wrestling). One plausible, sport-science-grounded explanation concerns the team-dependent, rotation-based nature of competitive volleyball, in which individual athletes' roles and identities are more tightly bound to a fixed team unit and playing rotation than in either individual sports (Track & Field, Badminton) or in sports with more flexible, distributed leadership roles; if so, the loss of that specific team-embedded identity structure at retirement could plausibly leave a larger post-retirement adjustment gap in exactly the psychosocial dimensions (emotional wellness, intellectual wellness, alcohol and drug habits) where Volleyball retirees scored lowest. This explanation is offered as a hypothesis for future, directly tested research (Section 6) rather than as a

confirmed finding, since the present design did not measure team role, athletic identity, or social-support mechanisms directly.

4.3 Physiological, Behavioural, and Psychological Interpretation of the Convergent Dimensions

The absence of a significant effect for physical fitness and nutrition merits its own explanation rather than being treated merely as a null result. Physiologically, all eight sports in this sample impose substantial aerobic, strength, or mixed conditioning demands during an athlete's competitive career, so that whatever residual training habits, movement literacy, or self-monitoring skills persist into retirement may be broadly comparable across disciplines, even though the specific physiological demands (endurance in Track & Field versus explosive power in Wrestling and Judo, for example) differ considerably during the competitive career itself. Behaviourally, the sample's relatively long retirement duration (M = 12.54 years) may mean that whatever sport-specific dietary or training-support structures existed during active competition (Yao et al., 2020) have, by this stage, been fully replaced by each individual's own post-career routine, driven more by current occupation, family, and personal health priorities than by the sport of origin. The borderline, test-dependent finding for social wellness (significant by Kruskal–Wallis but not ANOVA) is consistent with a real but small and non-normally distributed sport effect that the present sample was only marginally powered to detect consistently across both tests; it is reported transparently rather than resolved in either direction and warrants replication with a larger or re-balanced sample.

4.4 Reliability, Validity, and the Interpretive Basis for These Findings

The reliability profile reported in Sections 2.5 and 3 (Table 5) has direct implications for how the present findings should be weighed. The negative or low alphas obtained for Nutrition, Spiritual Wellness, Emotional Wellness, Physical Fitness, Stress Management, and Intellectual Wellness at the five-item sub-scale level indicate that individual sub-scale scores should be interpreted as indicative rather than as psychometrically precise measurements of their nominal construct, most plausibly because of unresolved reverse-item keying issues rather than genuine construct incoherence (Section 2.5). This is precisely why the present study's central evidentiary claim rests on the 40-item composite score ($\alpha = .86$), whose sport effect ($\eta^{j} = .194$) was also the largest and most consistently significant across both ANOVA and Kruskal–Wallis tests of any dependent variable examined. The sub-scale-level findings reported in Sections 3 and 4.1–4.3 remain individually informative particularly because five of the eight sub-scales converged with the composite-score pattern in showing significant sport effects, and the pattern of which specific sports differed on which sub-scales was internally coherent (e.g., Volleyball's shortfall recurring across alcohol and drug habits, emotional wellness, and intellectual wellness) but they should be read as suggestive, hypothesis-generating detail beneath the more robust composite-level finding, not as free-standing, fully precise measurements in their own right. This distinction is maintained consistently through the remainder of the manuscript.

4.5 Comparison with the Broader Retired-Athlete Literature

The present composite-level finding of significant, sport-dependent variation in health-related lifestyle both extends and qualifies the international literature reviewed in Section 1. Filbay et al.'s (2019) systematic review found former athletes' physical health broadly comparable to, and mental health somewhat better than, the general population on average; the present data are consistent with a broadly favourable overall profile (composite scores in this sample clustered well above the scale midpoint) but show that this favourable average conceals systematic differences by sport of origin, a level of granularity that a general former-athlete-versus-general-population comparison cannot reveal. Yao et al.'s (2020) finding that nutritional habits can decline after the structured dietary support of an active career ends is not contradicted by the present null sport effect for nutrition, since a uniform post-retirement decline relative to the athlete's own earlier career, common to all eight sports, is fully compatible with sports not differing from one another at a single post-retirement time point. Alshaer et al.'s (2025) finding that retirement attenuates, without eliminating, elite sport's health benefits aligns with the present composite scores remaining above the scale midpoint for every sport while still varying significantly among sports that is, retirement appears to move all eight groups' health-related lifestyle in a broadly similar direction from their competitive-career baseline, while sport of origin continues to shape the psychosocial and behavioural dimensions on which they differ.

5. CONCLUSION

This study compared health-related lifestyle across eight dimensions and a composite score among 400 retired male professional sportspersons from eight structurally different Indian sports, ten to twenty years after retirement. Physical fitness and nutrition did not differ significantly by sport, but alcohol and drug habits, spiritual wellness, emotional wellness, stress management, and intellectual wellness did, and the composite Overall Health-Related Lifestyle score differed by sport with a large effect size ($\eta^2 = .194$), driven chiefly by comparatively strong composite scores among Cricket and Track & Field retirees and a comparatively weak composite score among Volleyball retirees. Scientifically, these findings indicate that health-related lifestyle after sports retirement in the Indian context is not a uniform consequence of the retirement transition itself but is shaped in part by characteristics carried forward from the specific sport played, particularly for its more psychosocial and behavioural dimensions; a single-indicator or single-sport approach to studying this population would risk missing exactly this differentiation. Practically, the findings suggest that Indian sports federations, welfare bodies, and public-health providers should not assume that a single, generic post-retirement support programme is equally sufficient across sports, and that federations whose retirees show a comparative shortfall on psychosocial dimensions in this sample, most clearly Volleyball may warrant more targeted, resourced post-retirement support. For policy, these results provide the kind of discipline-specific, empirical evidence that current Indian welfare initiatives for retired sportspersons (Section 1) have so far lacked, and that could inform how limited welfare resources are allocated across federations going forward...

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