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**Research Article**

# Dominant Factors That Influence the Interest of Gemati Tennis Academy Members

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**Abstract:**

Background: The increasing interest in tennis has contributed to the growth of local sports clubs, including the Gemati Tennis Academy in Trenggalek Regency, East Java. As a community-based sports organization, the academy supports technical skill development, character building, and active lifestyles. However, variations in members' participation levels indicate that different factors may influence their interest in tennis training activities.

Methods: This study employed a quantitative descriptive design using a survey method. The participants were all 49 members of the Gemati Tennis Academy selected through total sampling. Data were collected using a closed-ended questionnaire covering 12 variables related to internal, external, and supporting factors. The instrument was tested for validity and reliability. Data analysis was conducted using Principal Component Analysis (PCA) with the assistance of SPSS software.

Result: The results of the PCA identified three dominant factors influencing members' interest in tennis training. Internal factors had the highest eigenvalue (4.674), indicating the strongest influence, followed by external factors (eigenvalue = 1.361) and supporting factors (eigenvalue = 1.164). These factors were extracted from the 12 observed variables and explained the structure of members' training interest.

Conclusion: Members' interest in tennis training at the Gemati Tennis Academy is influenced by internal, external, and supporting factors, with internal factors being the most dominant. These findings provide valuable insights for coaches and club managers in developing effective and sustainable training programs to enhance member participation.

Keywords: Gemati Tennis Academy, PCA, Sports Club, Tennis

## 1. INTRODUCTION

Sport is an essential part of modern society, not only for its benefits to physical fitness but also as a means of improving overall quality of life. Global awareness of the importance of physical activity is growing, along with the surge in the prevalence of non-communicable diseases closely linked to a sedentary lifestyle. In Indonesia, the trend of exercising is gaining popularity among various groups, both as part of a healthy lifestyle and as a fun social activity. According to Muspita et al. (2018), a person's success in physical activity is determined by their perseverance and the balance between the challenges faced and their physical fitness.

Sports activities have also been shown to have a positive impact on mental health, including reducing stress and improving sleep quality. Tennis is an attractive option because it combines physical, mental, and social aspects in one activity that can be enjoyed competitively or recreationally.

Regular participation in sports has been widely acknowledged as an effective strategy to improve both physical and mental health. The World Health Organization (2020) emphasizes that consistent physical activity reduces the risk of non-communicable diseases and contributes to psychological well-being. Furthermore, Ekelund et al. (2024) reported that engagement in sports activities is associated with reduced stress levels, improved mood, and better sleep quality. These findings reinforce the importance of sports participation as a key component of a healthy and active lifestyle.

The growing interest in tennis is reflected in the growth of various sports communities and clubs locally, including in Trenggalek Regency, East Java. The establishment of the Gemati Tennis Academy in 2022 is concrete evidence of the growing public interest in this sport. This club serves not only as a technical training venue but also as a platform for

character development, discipline, and teamwork among members. Amali (2022) states that the existence of sports clubs plays a crucial role in encouraging active community participation in a healthy lifestyle while also serving as a means of identifying potential athletes (Hopkins et al., 2022). In the context of education and youth development, sports clubs also help students develop their talents from an early age, as noted by (Meklin et al., 2024; Wang et al., 2024). The availability of representative sports facilities and the regular holding of local tournaments further attract the public to join communities like Gemati Tennis Academy.

Tennis is recognized as a sport that integrates physical endurance, mental focus, and social interaction. According to Ekelund et al. (2024), regular participation in tennis improves cardiovascular fitness, coordination, and psychological resilience. In addition, community-based sports clubs play a strategic role in promoting lifelong sports participation and fostering character development through structured training programs (Amali, 2022). Sports clubs also serve as social environments that encourage interaction, discipline, and commitment among members, thereby strengthening long-term engagement in physical activity (Joung et al., 2023; Kwon & Jang, 2024).

To examine the complexity of factors influencing sports participation interest, an analytical approach capable of identifying dominant underlying structures is required. Principal Component Analysis (PCA) is a multivariate statistical technique that reduces a large number of correlated variables into a smaller set of independent components that represent the original data structure (Hair et al., 2019). This method has been widely applied in sports science research to identify dominant factors affecting participation behavior and motivation.

The growth of Gemati Tennis Academy's membership has shown a positive trend over time. Since its inception, the club has attracted over 50 active members of various ages and backgrounds (R. Eime et al., 2019). However, not all members demonstrate the same level of participation in training and other club activities. Some members are highly active and enthusiastic, while others are less consistently involved (Telford et al., 2019). This diversity raises questions about the factors influencing members' continued active participation (Zhao et al., 2026). The complexity of this issue requires an analytical approach capable of identifying dominant factors objectively and measurably (Rojas-

Valverde et al., 2020). One relevant statistical method to address this issue is Principal Component Analysis (PCA), a technique used to simplify a large number of variables into key components that are uncorrelated but significantly represent the original variables.

Differences in participation levels among sports club members are often influenced by multiple interrelated factors. Previous studies suggest that internal factors such as motivation, personal interest, health condition, and lifestyle play a crucial role in determining an individual's willingness to engage in sports activities (R. M. Eime et al., 2025). In addition, external factors including training schedules, availability of facilities, coaching quality, and family support significantly affect sustained participation in sports programs (Garcia-Pascual et al., 2023; Tsartsapakis et al., 2026). Furthermore, a supportive social environment and a comfortable training setting further enhance enjoyment and a sense of belonging, which are essential for maintaining long-term participation (Zhang et al., 2025; Shannon et al., 2022).

Member interest in club activities is inextricably linked to the influence of various factors, both internal and external. This study aims to address the limited research gap regarding the dominant factors influencing member interest in the context of a local tennis club like Gemati Tennis Academy. Unlike previous research, which focused primarily on the influence of physical exercise on athlete performance or achievement, this study focuses on the psychosocial and structural aspects that encourage continued participation. Therefore, this study aimed to: (1) determine the extent to which internal factors influence members' interest in participating in tennis training at Gemati Tennis Academy, (2) determine the extent to which external factors contribute to this interest, and (3) identify the most dominant factors influencing member interest. With a more comprehensive understanding, the results of this study are expected to provide a basis for designing more effective and sustainable club management strategies.

## 2. MATERIAL AND METHOD

This research method uses a non-experimental quantitative descriptive approach, where the researcher does not manipulate or control the variables (Sugiyono, 2019). A quantitative descriptive approach is appropriate for this study because it aims to describe and analyze existing

phenomena without manipulating research variables. This approach allows researchers to systematically measure participants' perceptions and interests based on empirical data collected through standardized instruments (Creswell & Creswell, 2018). By applying this design, the study seeks to objectively identify patterns and dominant factors influencing members' interest in tennis training. The objects of the study were all 49 members of the Gemati Tennis Academy, and the entire population was sampled through a total sampling technique. The study was conducted at the Gemati Tennis Academy from April to May 2025. The research procedure began with the preparation of an instrument in the form of a closed questionnaire, followed by direct distribution of the questionnaire to respondents, and data collection and analysis. The data collection technique used was a non-test method in the form of a questionnaire with four answer choices (SS, S, TS, STS), which aims to identify the dominant factors that influence members' interest in participating in training.

This research instrument was tested for validity and reliability to ensure the accuracy of the quantitative data collected. Data were analyzed using Principal Component Analysis (PCA) with the help of SPSS 22 software. PCA is used to reduce a number of variables into independent and uncorrelated main components, through the stages of calculating eigenvalues, eigenvectors, correlation matrices, Bartlett's test, and the KMO index. The analysis was conducted to determine significant factors based on eigenvalues above 1. The limitations of this study lie in its limited scope only to members of the Gemati Tennis Academy, so the results cannot be generalized widely.

## 3. RESULT AND DISCUSSION

### 3.1 Result

In the research, the data presented consisted of 12 variables, each consisting of 2 to 5 statements, for a total of 40 statements. Afterward, questionnaires were distributed to all 49 respondents, obtaining an r value of 0.276, where the calculated r value is greater than the table r value. Furthermore, for the Cronbach's Alpha reliability test, the questionnaire is considered reliable if the Cronbach's Alpha value is greater than 0.6. Table 4.2 shows that the reliability test results are valid if the Cronbach's Alpha value (0.933) is greater than 0.6. Therefore, the item value is considered reliable.

Next, factor analysis was conducted using the Principal Component Analysis (PCA) method. This test was conducted on all existing variables, followed by several tests. If a variable tends to create a new factor, then a variable will have a high correlation with other variables. Conversely, if the correlation between variables tends to be lower, it is certain that it does not belong to the predetermined factor grouping.

The testing was conducted using SPSS 22, using the PCA (Principal Component Analysis) method, which began with the KMO and Bartlett's tests, the MSA (Measure of Sampling Adequacy) tests, extraction or factoring, and Varimax rotation. This method aims identify factors using factor analysis. The stages include:

**Table 1.** KMO and Bartlett's Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .792 |
|---|---|---|
| **Bartlett's Test of Sphericity** | **Approx. Chi-Square** | 212.222 |
| | **df** | 66 |
| | **Sig.** | .000 |

The KMO and Bartlett's test are useful for analyzing correlations between the variables determining the factors. Based on the calculation results, the Bartlett's test in factor analysis shows a correlation and sample size sufficient for continuous analysis, with a Sig value of less than <0.05 and a KMO value greater than >0.05. Therefore, the data is sufficient for factorization. Table 4.15 shows that the KMO and Bartlett's Sphericity values are 0.545, indicating that the factor analysis process can proceed because it meets the criteria, namely, between the calculated KMO and the table KMO values (0.545 > 0.5).

The Measure of Sampling Adequacy (MSA) test was performed on all variables. The Measure of Sampling Adequacy (MSA) test is conducted to ensure that the process between eligible and non-eligible variables is running smoothly. If a variable meets the requirements, it can be further processed; if it does not meet the requirements, it is removed from the other variables and retested using the Measure of Sampling Adequacy (MSA) test. The purpose of the Measure of Sampling Adjudication (MSA) is to analyze and identify each variable to be processed, which then needs to be considered. If the MSA value does not exceed 0.5, the variable cannot be further processed and is reapplied. Variables that pass the

MS4 test, for variables X1 to X15, meet the MSA test criteria, with an overall MSA value of 0.5, and are then extracted.

The results of the extraction of a number of variables influencing interest in Gemati Tennis Academy revealed a correlation between the 12 variables. The total number of extracted factors is determined by the ecoskil results. Table 4.18 shows that there are three factors, all of which have an eigenvalue of 1.0. The calculation for determining the number of factors can also be presented in a graph called a "screw plot." The emergence of these three factors can also be seen in the screw plot graph, which corresponds to Figure 1
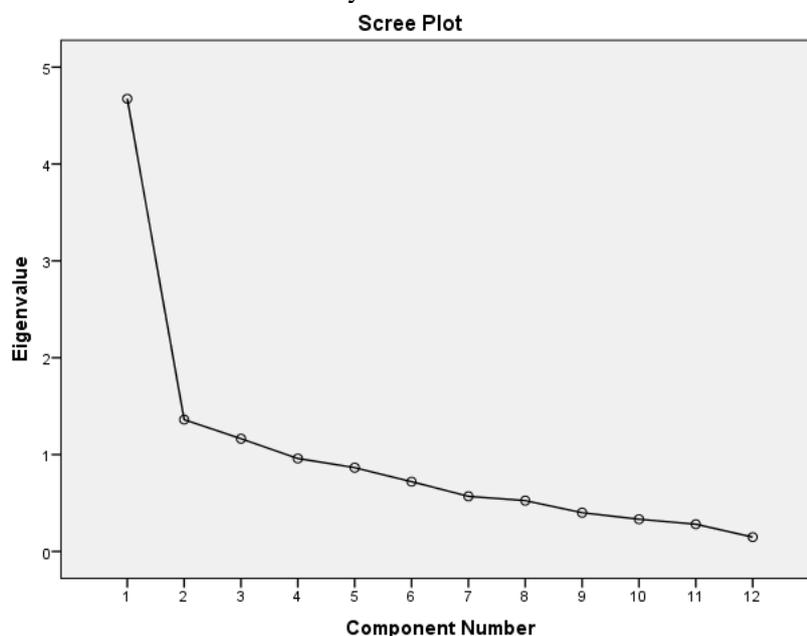


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**Figure 1.** Scree plot of principal component analysis showing dominant factors influencing members' interest in tennis training.

Figure 1 shows the scree plot clearly showing that point 1 is at the very top, and point 3 is below point 1, indicating a sharp decrease from point 1. This graph indicates that factor 1 has a close relationship with a large number of 40 variables. Factor 3 has fewer variables than factor 1. Variables that passed the Measure of Sampling Adequacy (MSA) test were integrated into a component matrix using factor rotation. The number of variables compared to their constituent factors was determined by the matrix.

**Table 2.** Rotation Result Group

| Variable | Factor Group | | |
|:---:|:---:|:---:|:---:|
| | 1 | 2 | 3 |
| XI | 1 | | |
| X2 | | | 3 |
| X3 | | 2 | |
| X4 | 1 | | |
| X5 | | 2 | |
| X6 | 1 | | |
| X7 | | 2 | |
| X8 | | 2 | |
| X9 | 1 | | |
| X10 | 1 | | |
| X11 | | 2 | |
| X12 | 1 | | |

By grouping the results of the factors that have been rotated, it can be seen that all available factors have their own variables and are well-arranged, including:

1. The first factor binds 6 variables that form
2. The second factor binds 5 variables that form
3. The third factor binds 1 variable that forms

## 3.2 Discussion

Based on the results of data analysis using the Principal Component Analysis (PCA) method, three main factors were identified that influence Gemati Tennis Academy members' interest in participating in tennis training. These three factors were formed based on eigenvalues greater than 1. This aligns with the PCA principle that only factors with eigenvalues greater than 1 are worthy of being retained in the analysis model. Based on the loading values, the most influential variable on the first factor is the extracurricular activity variable, with the highest loading value of 0.741. This factor binds three other variables, also related to the individual's internal state. Therefore, the first factor was named the internal factor. This designation aligns with the opinions of Garcia-Pascual et al., (2023) and Tsartsapakis et al. (2026), who state that internal factors include interest, motivation, health, lifestyle, and extracurricular activities. Extracurricular activities, or leisure time, act as a lifestyle factor that encourages someone to engage in activities such as tennis training.

The second dominant factor is practice time, with a loading value of 0.774. This factor binds four other variables originating from outside the individual, thus being referred to as external factors. According to (Downward & Rasciute, 2025), external factors include environmental elements and social support such as time, facilities, coach quality, and family support. Flexible practice times allow members to find time amidst their busy schedules, which is a crucial aspect of exercise interest (Ntoumanis et al., 2021). Coach quality and family support have also been shown to support continued practice interest. The third factor is called the supporting factor, with the dominant variable being the social environment or tennis venue environment, which has the highest loading value and binds the other two variables (Hallmann et al., 2022). This environment encompasses social interactions between members and comfort within the practice venue, which aligns with the definition of the external environment. The presence of good facilities and a supportive community can increase members' comfort and interest in tennis practice (M. Zhang et al., 2022).

Overall, the results of this analysis support previous theories stating that interest in participating in tennis training is influenced by internal and external factors. These three factors collectively represent the main structure of the interest variables, with grouping based on the correlational strength (loading factor) of each component in the PCA.

### 3.2.1 Implication

The findings of this study have important practical implications for the management and coaching practices at the Gemati Tennis Academy. The dominance of internal factors indicates that members' intrinsic motivation, interest, and personal attitudes play a crucial role in sustaining participation in tennis training. Therefore, coaches and club managers are encouraged to design training programs that are enjoyable, motivating, and aligned with members' personal goals. In addition, external and supporting factors such as training schedules, facilities, coaching quality, and a supportive social environment should be continuously optimized to create a comfortable and engaging training atmosphere. By addressing these factors simultaneously, sports clubs can enhance member satisfaction and long-term participation.

### 3.2.2 Researcrh Contribution

This study contributes to the field of sports science by providing empirical evidence on the structure of participation interest in a community-based tennis academy using a multivariate statistical approach. Unlike previous studies that primarily focused on athletic performance or competitive outcomes, this research emphasizes psychosocial and environmental factors influencing sports participation. The application of Principal Component Analysis (PCA) offers a systematic method for identifying dominant factors from multiple observed variables, thereby enriching methodological approaches in sports participation research. The findings also contribute to the existing literature by confirming the relevance of internal, external, and supporting factors in shaping sustained engagement in sports activities.

### 3.2.3 Limitations

Despite its contributions, this study has several limitations that should be acknowledged. First, the sample was limited to members of a single tennis academy, which may restrict the generalizability of the findings to other sports clubs or regions. Second, the data were collected using a self-reported questionnaire, which may be subject to response bias. Third, the study employed an exploratory approach using PCA, which identifies factor structures but does not confirm causal relationships among variables. These limitations

should be considered when interpreting the results.

### 3.2.4 Suggestions

Based on the findings and limitations of this study, several suggestions can be proposed for future research and practice. Future studies are encouraged to involve larger and more diverse samples from multiple sports clubs to enhance generalizability. The use of confirmatory analytical methods, such as Confirmatory Factor Analysis (CFA) or Structural Equation Modeling (SEM), is recommended to validate the factor structure identified in this study. In practical terms, club managers and coaches should focus on strengthening internal motivational factors while maintaining supportive external conditions to foster sustainable participation in tennis training programs.

## 4. CONCLUSION

Based on the results of the research and data analysis that has been carried out in a structured manner, it can be concluded that there are several important factors that influence the interest in training at Gemati Tennis. These factors can be classified into 3 factors, namely: Internal factors with an eigenvalue of 4.674, External Factors (1.361), and Supporting Factors (1.164). The first factor is formed from four variables with the same principle, the second factor is formed from five variables, and the third factor is formed from three variables. These results are the result of 12 variables that have been extracted or factored.

## 5. ACKNOWLEDGEMENT

## 6. AUTHOR CONTRIBUTION STATEMENT

VMS conceptualized the study, designed the research framework, conducted data collection, performed data analysis, and prepared the original manuscript draft. PBD contributed to instrument development, data processing, and interpretation of results. HGP contributed to methodological supervision, statistical analysis support, and critical revision of the manuscript. NF contributed to literature review, discussion refinement, and final manuscript editing. All authors read and approved the final version of the manuscript.

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## REFERENCE

Amali, Z. (2022). Kebijakan olahraga nasional menuju Indonesia Emas tahun 2045. *Jurnal Olahraga Pendidikan Indonesia (JOPI)*, *2*(1), 63–83. https://doi.org/10.54284/jopi.v2i1.197

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.)*. SAGE Publications.

Downward, P., & Rasciute, S. (2025). Exploring the covariates of sport participation for health: an analysis of males and females in England. *Journal of Sports Sciences*, *33*(1), 67–76. https://doi.org/10.1080/02640414.2014.924056

Eime, R. M., Charity, M. J., Harvey, J. T., & Payne, W. R. (2025). Participation in sport and physical activity: associations with socio-economic status and geographical remoteness. *BMC Public Health*, *15*(1), 434. https://doi.org/10.1186/s12889-015-1796-0

Eime, R., Payne, W., & Harvey, J. (2019). Trends in

organised sport membership: Impact on sustainability. *Journal of Science and Medicine in Sport*, *12*(1), 123–129. https://doi.org/10.1016/j.jsams.2007.09.001

Ekelund, U., Sanchez-Lastra, M. A., Dalene, K. E., & Tarp, J. (2024). Dose-response associations, physical activity intensity and mortality risk: A narrative review. *Journal of Sport and Health Science*, *13*(1), 24–29. https://doi.org/10.1016/j.jshs.2023.09.006

Garcia-Pascual, F., Ballester-Esteve, I., & Calabuig, F. (2023). Influence of sports participation on the behaviours of customers of sports services: Linear and qualitative comparative analysis models. *Healthcare*, *11*(9), 1320. https://doi.org/10.3390/healthcare11091320

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8 ed.). Cengage Learning.

Hallmann, K., Wicker, P., Breuer, C., & Schönherr, L. (2022). Understanding the importance of sport infrastructure for participation in different sports-findings from multi-level modeling. *European Sport Management Quarterly*, *12*(5), 525–544. https://doi.org/10.1080/16184742.2012.687756

Hopkins, C. S., Hopkins, C., Kan, S., & Watson, A. (2022). A Systematic Review of Factors Associated with Sport Participation among Adolescent Females. *International Journal of Environmental Research and Public Health*, *19*(2), 3353. https://doi.org/10.3390/ijerph19063353

Joung, K., Jeon, W., & Kwon, G. (2023). Relationship between perceived enjoyment, exercise commitment and behavioral intention among adolescents participating in "School Sport Club". *Frontiers in Medicine*, *10*(5), 1277494. https://doi.org/10.3389/fmed.2023.1277494

Kwon, J., & Jang, J. (2024). The Relationship Between Sports Club Participation, Physical Activity, and Health Behaviors Among Older Korean Adults. *Healthcare*, *12*(23), 2411. https://doi.org/10.3390/healthcare12232411

Meklin, E., Laukkanen, A., Niemistö, D., Kotkajuuri, J., Luukkainen, N.-M., & Sääkslahti, A. (2024). Early childhood physical activity parenting and sport club participation as predictors of perceived motor competence – a three-year longitudinal study. *Physical Education and Sport Pedagogy*, 1–15. https://doi.org/10.1080/17408989.2024.2352823

Muspita, M., Kamarudin, K., & Fernando, R. (2018). Profil Kebugaran Jasmani Mahasiswa Penjaskesrek Semeter I FKIP UIR Tahun 2015/2016. *Journal Sport Area*, *3*(1), 70–78. https://doi.org/10.25299/sportarea.2018.vol3(1).1306

Ntoumanis, N., Ng, J. Y. Y., Prestwich, A., Quested, E.,

Hancox, J. E., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Lonsdale, C., & Williams, G. C. (2021). A meta-analysis of self-determination theory-informed intervention studies in the health domain: effects on motivation, health behavior, physical, and psychological health. *Health Psychology Review*, *15*(2), 214–244. https://doi.org/10.1080/17437199.2020.1718529

Rojas-Valverde, D., Pino-Ortega, J., Gómez-Carmona, C. D., & Rico-González, M. (2020). A Systematic Review of Methods and Criteria Standard Proposal for the Use of Principal Component Analysis in Team's Sports Science. *International Journal of Environmental Research and Public Health*, *17*(23). https://doi.org/10.3390/ijerph17238712

Shannon, S., Prentice, G., Brick, N., Leavey, G., & Breslin, G. (2022). Longitudinal Associations Between Athletes' Psychological Needs and Burnout Across a Competitive Season: A Latent Difference Score Analysis. *Journal of Sport & Exercise Psychology*, *44*(4), 240–250. https://doi.org/10.1123/jsep.2021-0250

Sugiyono. (2019). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif Dan R&D*. CV Alfabeta. https://doi.org/www.cvalfabeta.com

Telford, R. M., Telford, R. D., Cochrane, T., Cunningham, R. B., Olive, L. S., & Davey, R. (2019). The influence of sport club participation on physical activity, fitness and body fat during childhood and adolescence: The LOOK Longitudinal Study. *Journal of Science and Medicine in Sport*, *19*(5), 400–406. https://doi.org/https://doi.org/10.1016/j.jsams.2015.04.008

Tsartsapakis, I., Zafeiroudi, A., Trigonis, I., & 2ORCID, C. K. (2026). Exercise Participation Among Physically Active Adults: A Multidimensional Analysis of Demographic, Anthropometric, Personality, and Behavioral Factors. *International Journal of Environmental Research and Public Health*, *23*(2), 209. https://doi.org/10.3390/ijerph23020209

Wang, W., Li, W., & Yao, J. (2024). The Relationship between Participation in Extracurricular Arts and Sports Activities and Adolescents' Social and Emotional Skills: An Empirical Analysis Based on the OECD Social and Emotional Skills Survey. *Behavioral Sciences*, *14*(4), 541. https://doi.org/10.3390/bs14070541

World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behaviour*. World Health Organization. https://www.who.int/publications/i/item/9789240015128

Zhang, M., Wang, X.-C., & Shao, B. (2022). Predictors of Persistent Participation in Youth Sport: A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, *13*.

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https://doi.org/10.3389/fpsyg.2022.871936

Zhang, Y., Wang, M., & Zhang, Y. (2025). Perceived social support and Chinese university students' intentions to participate in non-traditional sports: a moderated chain mediation model. *Frontiers in Psychology*, *16*, 1–19. https://doi.org/10.3389/fpsyg.2025.1586099

Zhao, K., Chen, Z., Huang, Q., Li, S., Tan, G., Guo, K., & Jiang, L. (2026). Multi-level determinants of physical activity and sports participation among adults during COVID-19 pandemic: an interpretable machine learning approach. *Frontiers in Psychology*, *16*, 1–22. https://doi.org/10.3389/fpsyg.2025.1701201