



## Research article

# Shaping futures: The impact of family involvement, peer and coach support on the career orientation of indigenous student athletes

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## ABSTRACT

This study explores the impact of family involvement on the career orientation of Indigenous baseball student athletes, considering the mediating roles of peer and coach support. Using Structural Equation Modeling, data were collected from 354 Indigenous student athletes registered on a regional baseball network between October and December 2022. The analysis reveals that family involvement directly influences career orientation significantly and also indirectly affects it through the mechanisms of peer and coach support. The findings highlight the critical need for integrated support from families, schools, and communities to foster the educational achievements and career orientations of these athletes. Recommendations include strengthening parental guidance, enhancing school support, and promoting community collaboration to provide extensive educational and training opportunities. It is crucial that schools, families, and sports clubs work together to develop tailored programs that address the unique cultural and social challenges faced by Indigenous student athletes. This collaborative approach aims to improve not only the athletes' career development but also their overall well-being, emphasizing the importance of a holistic support system that considers the socio-economic and cultural dynamics influencing these athletes. Furthermore, the study advocates for policies that recognize the distinctive needs and contributions of Indigenous athletes in sports, fostering a more inclusive and supportive environment. Engaging with the broader community and leveraging cultural strengths can enhance these initiatives, promoting lasting benefits for Indigenous student athletes.

## 1. Introduction

With the continuous diversification of society, the career development pathways of Indigenous student athletes have become an important topic of research in education and sociology [1]. Particularly in the realm of sports, the situation of Indigenous student athletes highlights the inequalities in educational opportunities and the challenges of cultural diversity [2,3]. Within Indigenous communities, baseball is not only a popular sport but has also become a significant avenue for social mobility and personal

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development among local youth [4]. However, Indigenous student athletes often face multiple challenges from family, society, and culture while pursuing athletic achievements. These challenges include, but are not limited to, limited economic resources [5,6], insufficient educational resources [7], and the complexity of cultural identity [3,8]. Many Indigenous student athletes come from low-income families, which not only limits their opportunities to participate in sports but also has a profound impact on their educational choices and career planning [9–13]. In these communities, sports are often seen as a means of social mobility, offering students the possibility to transcend family economic limitations. The local area is also a cradle for nurturing professional baseball players, reflecting high societal expectations and their desire to achieve social mobility through sports [14,15].

In addressing the unique challenges and opportunities faced by Indigenous Baseball Student Athletes, it is crucial to consider the specific developmental stages of these individuals. Research indicates that the impact of family, peer, and coach support can vary significantly across different age groups, reflecting developmental differences in cognitive, emotional, and social maturation [5,6]. For instance, younger athletes may require more direct guidance and emotional support from coaches and family, which aligns with findings that younger adolescents benefit from structured support systems in sports environments [8]. In contrast, older athletes might place a higher value on autonomy and peer relationships, influencing their career orientation and development in distinct ways [3,9]. Furthermore, the role of cultural identity, which plays a significant part in the lives of Indigenous athletes, may also be perceived and integrated differently across ages. Younger athletes might still be forming their cultural identities, thus requiring more culturally relevant mentoring and support [7]. This contrasts with older athletes who might already have a firm sense of their cultural identity and seek ways to align it with their career aspirations [15].

Athletic achievements depend not only on personal effort and talent but are also deeply influenced by family culture and social environment [5,6,9]. Parental Involvement (PI) plays a crucial role in these students' athletic careers, affecting their sporting habits and career development [15–17]. In this context, family support manifests not only in material resources but also in cultural identity, value orientation, and attitudes towards education. The cultural background of Indigenous families provides a unique perspective for their children's education and career development. These families might hold different expectations and values, influencing their views on their children's education and career choices. They are more inclined to achieve social mobility through sports participation, placing less emphasis on traditional educational pathways compared to other families [15,18]. The educational status of Indigenous student athletes highlights the challenges of social inequality and cultural differences, offering a unique perspective on how this group shapes their Career Orientation (CO) under the multifaceted influences of family, society, and culture [3]. This backdrop sets the tone for this study, aiming to delve into the career development processes of Indigenous student athletes under the support of family, peers, and coaches, and how these factors collectively influence their career choices and development.

Family plays a pivotal role in the career orientation of Indigenous baseball student athletes. This support is crucial not only in providing necessary material resources but also in offering emotional support, a sense of cultural identity, and encouragement to pursue personal goals. The attitudes and behaviors of families significantly impact children's self-efficacy, sense of achievement, and life satisfaction. When parental involvement is combined with educational and career aspirations, it can lay the foundation for students to pursue higher levels of education and career achievements. Research by Sime and Sheridan (2014) emphasizes the importance of social and cultural aspects among economically disadvantaged groups, highlighting how families support their children's education and athletic development through investing time, money, and energy [19]. Additionally, Moret and Ohl (2019) pointed out the significant impact of family beliefs and social support on the educational pathways of elite athletes [20], further highlighting the crucial role of family in shaping athletes' career orientation [21–24]. In Indigenous communities, parental involvement is not only reflected in the provision of material resources but also in the transmission of cultural identity and values, collectively shaping students' career aspirations and orientation [25]. For Indigenous baseball student athletes, this means that the attitudes towards sports and education and the support provided by their families not only affect their athletic achievements but also influence their educational decisions and career planning.

Coach Support (CS) is a multifaceted concept that encompasses more than just technical and strategic guidance. It also includes psychological and emotional support, which are crucial for the holistic development of Indigenous student athletes. According to Moret and Ohl (2019), coaches act as mentors who recognize and nurture the potential, abilities, and achievements of their athletes [20]. This recognition significantly enhances the students' confidence, motivation, and future expectations, directly influencing their career orientation. Two key types of Coach Support have been identified as particularly beneficial for students. (1) Technical and strategic guidance: This form of support involves training, tactics, and skills development, which are essential for athletic performance. Coaches provide the knowledge and expertise needed to excel in sports, helping students develop the competencies necessary for a potential career in athletics [1,22]; (2) Psychological and Emotional Support: Beyond the physical aspects of training, coaches also play a vital role in supporting the mental well-being of athletes. This includes offering encouragement, helping athletes manage stress and setbacks, and fostering a positive mindset. Such support is crucial in helping students navigate the pressures of competitive sports and their broader life challenges, thereby positively impacting their career orientation [20]. The influence of Coach Support on Career Orientation is significant because it not only prepares students for athletic success but also shapes their aspirations and decisions regarding their future careers. By providing both technical expertise and emotional support, coaches help athletes build a strong foundation for their career paths, whether in sports or other fields. Additionally, Peer Support (PS) complements the role of Coach Support by offering a social environment where students can share experiences, receive feedback, and build confidence. Peer groups provide opportunities for collaboration and mutual encouragement, which are essential for developing a positive self-concept and setting realistic career goals [26,27]. Coach Support is not a one-dimensional concept but rather a comprehensive form of guidance that is crucial for the career development of Indigenous student athletes. Both the technical guidance and the emotional support are vital components that contribute to shaping these students' career orientations.

Discussing the importance of family, peers, and coaches in shaping students' career orientation, research by Kalka and Lockiewicz

(2017) provides key insights [28]. Their study highlights the critical role of social support in dealing with challenging situations, especially for groups facing specific challenges. This is equally applicable to Indigenous student athletes, particularly in the competitive sports field. Therefore, this study aims to reveal how Indigenous baseball student athletes form and achieve their career goals with the multilayered support of family, peers, and coaches. By understanding how these supports function together at different levels, this study hopes to offer a more comprehensive insight into the education and career development of Indigenous student athletes and guide relevant policies and practices. This study is rooted in a deep understanding of the socioeconomic and cultural background of Indigenous families and how these factors shape the career development of student athletes. In Indigenous communities, the socioeconomic status and cultural background of families have a profound impact on the education and career choices of student athletes. Indigenous families often face challenges of limited resources, which not only restrict opportunities for sports participation but may also affect students' education and career aspirations [3,4,29,30]. Hence, the purpose of this study is to explore how family and societal support affect the career choices and development of Indigenous baseball student athletes, especially how families shape the career orientation (CO) of student athletes through various forms of support, including parental involvement (PI), peer support (PS), and coach support (CS). By understanding these complex dynamics, this research aims to provide insights and strategies to enhance the educational and career success of Indigenous student athletes (Fig. 1).

The hypotheses are designed to explore the multilayered support system (family, peers, coaches) and its impact on the career orientation paths of Indigenous student athletes, aligned with the primary aim of the study.

**Hypothesis 1.** (H1): Family involvement positively influences the career orientation of Indigenous baseball student athletes.

**Hypothesis 2.** (H2): Peer support mediates the relationship between family involvement and career orientation in Indigenous baseball student athletes.

**Hypothesis 3.** (H3): Coach support mediates the relationship between family involvement and career orientation among Indigenous baseball student athletes.

## 2. Methodology

### 2.1. Participants and process

The study targeted baseball athlete students registered with the Taitung County Baseball Network, primarily consisting of approximately 533 elementary, middle, and high school student athletes. The survey was conducted from October to December 2022, yielding 354 valid samples from student athletes, all of whom identified as Indigenous. Considering ethical standards, this research was approved by the Human Research Ethics Committee of National Cheng Kung University (No. 110-566-2). Throughout the process, participants were fully informed about the study's sponsor, principal investigator, purpose, design, and participant rights (including rights content, complaint mechanism, data disclosure, and data preservation mechanisms, etc.) through the informed consent form. For participants under 20, consent was also obtained from their guardians, and all documents fully disclosed the key points of research ethics standards.

This study explored causal relationships among multiple variables. To ensure the statistical significance and robustness of the results, we estimated the required sample size using G\*Power software. With the significance level ( $\alpha$ ) set at .05 and statistical power at .90, a larger effect size ( $f^2 = .35$ ) was selected for sample size estimation. According to the results from G\*Power, a minimum of 173 samples was needed to ensure statistical significance. The actual survey yielded 402 valid responses, far exceeding the required minimum, thereby ensuring the reliability and robustness of the study's conclusions. Combined with ethical review, sample size estimation, and the actual data collected, this research was designed and implemented with scientific integrity, ethical considerations, and credible results.

### 2.2. Measurement of variables

#### 1 Background Variables

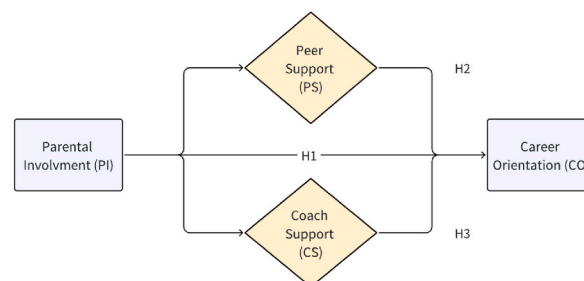


Fig. 1. Career Orientation Influence Model for Baseball Student Athletes.

Include “educational stage” with options for elementary, middle, and high school; “years of sports participation” filled in by respondents; “weekly practice hours” and “weekly practice days” also filled in by respondents; “future desired job field” categorized as related or unrelated to sports.

## 2. Parental Involvement

Developed based on related literature [3,4,21,31], items include “my family encourages me to do sports,” “my family agrees with me doing sports,” and “my family discusses sports-related matters with me,” scored from 1 to 5 for responses ranging from “strongly disagree” to “strongly agree.” CFA analysis yielded a CR value of .81 and an AVE value of .59, indicating good reliability and validity.

## 3. Peer Support

Developed based on related literature [4,27], items include “peers accompany me in sports,” “peers encourage me to do sports,” “peers praise my sports performance,” and “peers discuss sports-related matters with me,” scored similarly. CFA analysis yielded a CR value of .90 and an AVE value of .70, indicating good reliability and validity.

## 4. Coach Support

Developed based on related literature [4,27](Hung, 2012; Zheng & Hung, 2018), items include “the coach instructs me in sports,” “the coach encourages me to do sports,” “the coach assists me in sports,” and “the coach discusses sports-related matters with me,” scored similarly. CFA analysis yielded a CR value of .88 and an AVE value of .64, indicating good reliability and validity.

## 5. Career Orientation

Developed based on related literature [3,4,32], items include “I am sure of which field I want to choose for my career,” “I can make a career decision,” “I am preparing for future goals,” “I am satisfied with the career I will pursue,” “I am confident in my career goal decisions,” and “I am planning my studies according to my career goals,” scored similarly. CFA analysis yielded a CR value of .93 and an AVE value of .69, indicating good reliability and validity.

The summary table displays the Confirmatory Factor Analysis (CFA) results, showing the validity and reliability of the scales for Parental Involvement (PI), Peer Support (PS), Coach Support (CS), and Career Orientation (CO). Each factor’s items are assessed for their factor loadings, composite reliability (CR), and average variance extracted (AVE), providing a detailed overview of the measurement model’s robustness and the constructs’ internal consistency (Table 1).

### 2.3. Data analysis

Data were analyzed using Python software modules Semopy 2.3.11, Pandas 1.2.5, Graphviz .20.1, and Researchpy .3.5, for descriptive statistics and structural equation modeling to test the relationships among variables.

**Table 1**  
Summary table of CFA validity and reliability for the scale.

| Factor/Item   | Factor Loadings | CR  | AVE |
|---|-----------------|-----|-----|
| <b>Parental Involvement (PI)</b>                        |                 | .81 | .59 |
| My family encourages me to do sports                    | .75             |     |     |
| My family agrees with me doing sports                   | .80             |     |     |
| My family discusses sports-related matters with me      | .74             |     |     |
| <b>Peer Support (PS)</b>                                |                 | .90 | .70 |
| Peers accompany me in sports                            | .81             |     |     |
| Peers encourage me to do sports                         | .83             |     |     |
| Peers praise my sports performance                      | .79             |     |     |
| Peers discuss sports-related matters with me            | .89             |     |     |
| <b>Coach Support (CS)</b>                               |                 | .88 | .64 |
| The coach instructs me in sports                        | .71             |     |     |
| The coach encourages me to do sports                    | .88             |     |     |
| The coach assists me in sports                          | .86             |     |     |
| The coach discusses sports-related matters with me      | .74             |     |     |
| <b>Career Orientation (CO)</b>                          |                 | .93 | .69 |
| I am sure of which field I want to choose for my career | .80             |     |     |
| I can make a career decision                            | .78             |     |     |
| I am preparing for future goals                         | .80             |     |     |
| I am satisfied with the career I will pursue            | .90             |     |     |
| I am confident in my career goal decisions              | .87             |     |     |
| I am planning my studies according to my career goals   | .82             |     |     |

### 3. Results

#### 3.1. Description of basic background variables for participants

In the background variables, among the Indigenous baseball student athletes, there were 123 (34.75 %) in elementary school, 140 (39.55 %) in middle school, and 91 (25.70 %) in high school. The total number of valid samples was 354, with an average age of  $13.14 \pm 2.67$  years, and all participants were male (100 %). Regarding future career direction, 301 (85.03 %) were related to sports, and 53 (14.97 %) were unrelated to sports (Table 2). The average years of specialized training was  $4.81 \pm 2.78$  years, the average hours of training per week was  $10.20 \pm 8.28$  h, and the average days of training per week was  $5.51 \pm 1.02$  days (Table 3).

#### 3.2. Structural equation modeling

The chi-square to degree of freedom ratio ( $\chi^2/df$ ) was 3.15. It is generally recommended that this value should be less than 2 or 3, but a more lenient criterion is less than 5 (Jöreskog & Sörbom, 1993). Considering the sample size, the model of this study is acceptable. With CFI at .95, Root Mean Square Error of Approximation (RMSEA) at .078, Adjusted Goodness of Fit Index (AGFI) at .92, Non-Normed Fit Index (NNFI) at .92, and TLI at .93, all indicators meet the standard values, indicating good external quality of the model. Therefore, the model's basic fit indexes, internal quality, and overall fit can be considered ideal, meaning the model's pathway diagram fits well with the actual observed data.

Importantly, this demonstrates that PI among Indigenous baseball student athletes has a direct or indirect positive impact on CO through PS and CS (Fig. 2).

**H1.** Parental Involvement (PI) has a direct effect on Career Orientation (CO). The path coefficient from PI to CO is significant with a value of .76, indicating a strong direct influence of parental involvement on career orientation of Indigenous baseball student athletes.

**H2.** Peer Support (PS) mediates the relationship between Parental Involvement (PI) and Career Orientation (CO). The indirect effect of PI on CO through PS is .19, calculated as the product of the path from PI to PS (.72) and the path from PS to CO (.27). This significant mediation underscores the role of peer support in enhancing the influence of parental involvement on career orientation.

**H3.** Coach Support (CS) mediates the relationship between Parental Involvement (PI) and Career Orientation (CO). The indirect effect of PI on CO through CS is .18, calculated as the product of the path from PI to CS (−.45) and the path from CS to CO (−.39). This indicates that coach support also plays a significant mediating role, albeit a complex one given the negative coefficients, suggesting a nuanced interaction where certain types of coach support might need to be further clarified or re-evaluated in context.

### 4. Discussion

This study focuses on the career orientation of Indigenous baseball student athletes, specifically examining the influence of family, peers, and coaches on their career development. The findings demonstrate that family involvement has a direct impact on athletes' career orientation and indirectly influences it through the mediation of peer and coach support. These results align with the research of Lin (2016) [15] and Scott & Willits (1998) [16], who emphasize the critical role of internal family culture and external social support in shaping athletes' career development. The multidimensional support provided by families—encompassing cultural identity, values, and encouragement of personal goals—is essential for strengthening athletes' self-affirmation and career orientation. Moreover, the impact of family culture and social support on educational and career paths is well-documented. Sime and Sheridan (2014) and Moret and Ohl (2019) further underscore the pivotal role of family in determining athletes' career orientation [19,20]. The support from families not only involves material resources but also includes crucial emotional and psychological aspects, which are key factors in shaping athletes' career trajectories.

The significant influence of peer groups on athletes' self-perception and career aspirations is corroborated, while Kalka and Lockiewicz (2017) highlight the importance of social support in overcoming challenges [28]. These findings are reinforced and expanded upon in this study, highlighting the essential role of social interaction, teamwork, and positive feedback provided by peers and coaches in fostering a supportive environment conducive to positive career development.

Indigenous student athletes' socioeconomic prospects are often constrained by their families' socioeconomic status, particularly in Indigenous-dominated areas. This limitation is not easily overcome by the athletes' talent and effort alone. This study supports the findings of Guillet et al. [9], who noted the substantial impact of a family's socioeconomic status on athletes' career choices. Similarly, Harrison and Lawrence (2003) demonstrated that athletes' career choices are heavily influenced by their family environment,

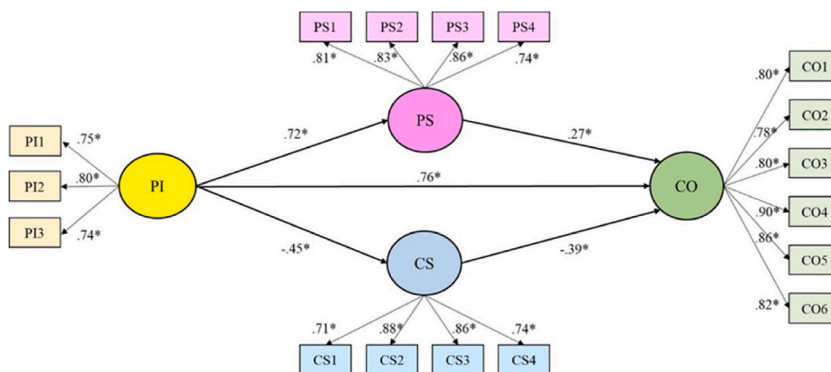
**Table 2**

Distribution of sample structure variables: Number and percentage.

| Variable                | Content             | N   | Percentage(%) |
|-------------------------|---------------------|-----|---------------|
| Education Stage         | Elementary school   | 123 | 34.75         |
|                         | Junior high school  | 140 | 39.55         |
|                         | Senior high school  | 91  | 25.71         |
| Future Career Direction | Related to sports   | 301 | 85.03         |
|                         | Unrelated to sports | 53  | 14.97         |

**Table 3**  
Distribution of sample structure: Mean and standard Deviation.

| Variable                      | Mean  | SD   | Min. | Median | Max. |
|-------------------------------|-------|------|------|--------|------|
| Years of Specialized Training | 4.81  | 2.78 | 0    | 5      | 14   |
| Weekly Training Hours         | 10.20 | 8.28 | 0    | 6      | 42   |
| Weekly Training Days          | 5.51  | 1.02 | 1    | 5      | 7    |



**Fig. 2.** The Mediation Analysis Result Career Orientation Influence Model for Baseball Student Athletes.  
Note: \*p < .05, PI = parental involvement, PS = peer support, CS = coach support, CO = career orientation.  
Chi-square = 350.04, df = 111, RMSEA = .078, CFI = .95, AGFI = .92, NFI = .92, TLI = .93.

especially within different cultural contexts [8]. The family’s socioeconomic status directly influences the resources and opportunities available to the athlete, thereby limiting their career choices and development potential.

As society becomes increasingly diverse, the career paths of Indigenous student athletes have emerged as a crucial area of educational and sociological research. In Indigenous communities like Taitung, baseball is not only a popular sport but also a vital avenue for youth to achieve social mobility and personal development. The results of this study confirm that family involvement positively impacts the career orientation of Indigenous baseball student athletes through the mediating roles of peers and coaches. This finding is consistent with previous research and offers essential insights for future policy-making and practice, particularly in supporting the education and career development of Indigenous student athletes. These results reflect the close relationships and interactions between families, peers, and coaches in Indigenous communities, collectively shaping the career orientations of young athletes. By integrating resources from families, schools, and communities, more opportunities can be created for Indigenous student athletes, helping them realize their potential and career aspirations.

**5. Conclusion**

This study explored how family, peers, and coach support influences the career orientation of Indigenous baseball student athletes. It found that family involvement plays a central role in shaping athletes’ career orientation, while peer and coach support impact career orientation through indirect paths. Family involvement is crucial for athletes’ interactions within the team and their personal career development. This support is not just in terms of material resources but also includes cultural identity, values, and attitudes towards education. In Indigenous communities, the positive attitude of families towards sports and education, along with their support, not only affects students’ athletic achievements but also influences their educational decisions and career planning. Coach support plays a decisive role in athletes’ career development, providing not just technical and strategic guidance but also crucial psychological and emotional support, significantly influencing career orientation. Peer support also significantly impacts athletes’ career orientation, offering social interaction, teamwork opportunities, and positive feedback on athletic skills and competition, influencing students’ self-perception and career aspirations.

This study makes a significant contribution to the field of career development for Indigenous baseball student athletes. By analyzing the impact of family, peers, and coach support on career orientation, it not only expands existing theories on athletes’ career development but also adds new perspectives and depth to the application of social support theory in the realm of sports, particularly within the cultural context of Indigenous social support. These findings provide profound insights into the socioeconomic impacts of sports activities within Indigenous communities.

In practice, this study provides essential insights for coaches, educators, and policymakers to better understand and support Indigenous student athletes, emphasizing the importance of enhancing family support and fostering social integration. Additionally, the findings help design and implement effective educational and training programs that highlight the role of family and community involvement, promoting the holistic development of athletes. From a policy perspective, the study lays a solid foundation for developing targeted education and sports policies for Indigenous athletes, demonstrating how to more effectively integrate family and

community resources to boost the success rates of sports programs and encourage community engagement and support.

Culturally and socially, the study underscores the importance of Indigenous culture in shaping athletes' careers, aiming to improve recognition of Indigenous athletes' roles in sports. By exploring the impact of family and community on Indigenous student athletes' career development, the research enhances understanding of this group's unique needs and advocates for a more inclusive and diverse sports environment. Overall, the research provides a comprehensive view of the career development of Indigenous baseball student athletes, offering practical recommendations to stakeholders to enhance athletes' career development and overall well-being.

This study makes significant contributions to the field of career development for Indigenous baseball student athletes by exploring the influence of family, peers, and coach support on Career Orientation. It adds new perspectives and depth to the application of support within the sports domain, particularly in the context of Indigenous populations. The insights gained are pivotal for designing and implementing effective education and training programs that focus on family and community participation, which are essential for the comprehensive development of athletes. The study's outcomes serve as a foundation for crafting education and sports policies that cater to the needs of Indigenous athletes, highlighting effective strategies for integrating family and community resources to enhance young athletes' development and the success of sports initiatives. Moreover, the research contributes to a greater understanding of the socioeconomic impacts of sports within Indigenous communities and the role of cultural and social factors in shaping athletes' careers, thereby promoting a more inclusive and diverse sporting environment.

## 6. Limitation and future suggestion

This study primarily focuses on Indigenous baseball student athletes from a specific regional area, and the geographical and cultural specificity of the sample may limit the generalizability of the research findings. Indigenous communities in different regions might have diverse cultural backgrounds and socioeconomic conditions, potentially affecting the characteristics and effects of family, peer, and coach support. Future research should consider expanding the sample range to include Indigenous baseball student athletes from various areas and backgrounds, enhancing the wide applicability and representativeness of the research results.

The study mainly relies on quantitative data from questionnaires, which may lead to biases in data interpretation, especially when explaining complex social and cultural factors. Adopting a mixed-methods research approach in the future could provide a more comprehensive capture and interpretation of the impact of family, peer, and coach support on the career development of student athletes. Quantitative data can offer reliability and general conclusions, while qualitative data can delve into individual experiences and social-cultural dynamics.

This research might not have fully covered all factors affecting the career development of Indigenous student athletes, particularly concerning social support and cultural identity. Future studies should consider additional factors that could influence the career development of Indigenous student athletes, such as socioeconomic status, educational policies, and community resources, to gain a more comprehensive understanding. Longitudinal studies could help understand the development pathways of Indigenous student athletes at different career stages and the changing needs for support over time.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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## Ethics statement

The studies involving human participants were reviewed and approved by the National Cheng Kung University Human Research Ethics Committee, approval No. NCKU HERC-E-110-566-2. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## CRedit authorship contribution statement

**Chia-Wen Lee:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Huang-Chia Hung:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

## Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Huang-Chia Hung reports financial support, administrative support, statistical analysis, and travel were provided by Ministry of Science and Technology. If there are other authors, they declare that they have no known competing financial interests or personal

relationships that could have appeared to influence the work reported in this paper.

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