A STUDY OF DESIGN AND DEVELOPMENT OF MANAGERIAL FRAMEWORK FOR SPORTS MANAGEMENT IN INDIA

Thesis Submitted in Partial Fulfillment of the Requirements of the Degree of

DOCTOR OF PHILOSOPHY

By

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Declaration

I, **Subodh Mor**, Ph.D. student Roll No.: 2K21/PhDDSM/08, hereby certify that the work which is being presented in the thesis entitled **"A Study of Design and Development of Managerial Framework for Sports Management in India"** in partial fulfillment of the requirements for the award of the Degree of Doctor of Philosophy, submitted in the Delhi School of Management, Delhi Technological University is an authentic record of my own research work carried out during the period from 23 June, 2021 to 05 August, 2024 under the supervision of **Dr. Shikha N. Khera and Prof. G. C. Maheshwari**.

The matter presented in this thesis has not been submitted by me for the award of any degree of this or any other Institute.

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Certified that **Subodh Mor** Roll No.: 2K21/PhDDSM/08 has carried out his research work presented in this thesis entitled **"A Study of Design and Development of Managerial Framework for Sports Management in India"** for the award of Doctor of Philosophy from Delhi School of Management, Delhi Technological University, Delhi under my supervision. The thesis embodies results of original work, and studies are carried out by the student himself and the content of the thesis do not form the basis of the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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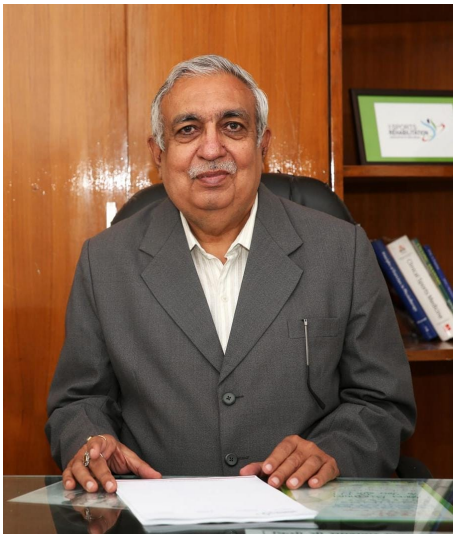

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2. Subodh Mor, Shikha N. Khera, G. C. Maheshwari, “Impact of Player Preparation on Effective Sports Management: parent ′s perspective”, *International Journal of System Assurance Engineering and Management*, 2023. (https://doi.org/10.1007/s13198-023-02013-z).

3. Subodh Mor, Shikha N. Khera, G. C. Maheshwari, “An Insight into Select Physical Parameters amongst Primary School Children: A Call for Sustainable Information for effective sports management“, *Ramanujan International Journal of Business and Research*, vol. 8, no. 1, pp. 80-91, June 2023.

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Abbreviations

AVE	**Average Variance Extracted**
DV	**Dependent Variable**
IOA	**Indian Olympic Association**
IV	**Independent Variables**
LRQ	**Literature Review Questions**
MV	**Mediating Variable**
NOA	**National Olympics Association**
NSF	**National Sports Federation**
OTC	**Olympic Training Centers**
PLS-SEM	**Partial Least Squares-Structural Equation Modeling**
PP	**Player Preparation**
RQ	**Research Questions**
SAI	**Sports Authority of India**
SM	**Sports Management**
VIF	**Variance Inflation Factor**

Abstract

Active participation in sports is essential for nation-building. It helps uplift the quality attributes, of determination, teamwork, discipline, productivity, and health in the mindsets of people in a nation. Given India's large population, it is critical to increase participation in sports to improve the overall health and productivity of the country. Further, improved participation will also increase the country's success rate in international sports. A large section of the sporting population not only contributes to physical well-being but also to the health index and higher level of economic activity in terms of trade, commerce and industry.

A study conducted by a team of orthopedic doctors in November 2016 at King George's Medical University showed that in India, 30% of the population in India has a flat foot. Flat foot in children may be painful and make them slower in the running than their counterparts. This may restrict them from participating in various categories of sports. It has been shown in the literature that age, weight, BMI, gender, physical activity, and knee position were the commonly used variables in determining the flat foot intensity and range. This study focuses on an essential physical attribute, namely a flat foot and knock knees.

The essential component in sports management is parent's involvement in building sports as a career for their children. It was found that various studies advocate that emotional, financial, and social support are the three critical parameters that will help in improving the athlete's educational, emotional and psychological status. However, few studies also emphasized that parental support can negatively impact the psycho-

logical status of a player if the involvement is not optimized. Thus, redefining the role of parents and educating them through various training programs can improve their involvement in sports with their children.

The significant aspect that requires investigation is the orientation of a player in sports management. It is seen that educational programs, proper nutritional guidance, psychosocial support, and motivational programs can prove to be effective in enhancing the player's orientation toward sports.

The coaches in India are expected to take charge of the overall components of players' development, including physical training, health and nutrition, counseling, and other factors. The coach's education must be reviewed, and a well-defined programme should be developed in India so that an effective coach who can contribute to the player's performance and communicate more effectively can be produced. The players in India need to be trained with well-designed educational and training programmes. In addition to field training, they are well aware of the theoretical and practical aspects, including sports education, professional orientation, nutritional awareness, and psychological aspects. A systematic and well-defined framework and methodology for sports management is currently conspicuous by its absence. Hence, it is essential to review and propose a model framework that can be successfully applied in the Indian context and focuses on all the key players of sports management.

Keeping in view the above and after a critical evaluation of available research about four key players in sports management are identified, namely 1) Physical Attributes such as Flat Foot and knock knees 2) Skillset of the Coach, 3) Parental Involvement 4) Player Orientation. In this study, an analysis of 1590 primary school children from two schools, in Delhi, aged between 6 to 10 has been carried out to detect the presence of two attributes, flat feet and knock knees, amongst these children. Further, this study develops and validates responses to a questionnaire collected from 82 Badminton coaches. This study also analyses the relationship between physical education, experience, agility, flexibility, endurance and strengthening in player preparation with sports

management. In doing so the perspective of the coach about player preparation has also been assessed.

To assess the parent's involvement, 314 parents whose children had participated in badminton sports atleast at the zonal level were considered. This work was done to find the relationship between emotional, financial and social support provided to players and sports management with a mediating role of player preparation. Suggestions from parents were sought regarding the requirement of separate specialist trainers for the players and support received from the government for playing sports. Further, feedback from parents has been considered in improving training facilities and national financial schemes.

To understand the perspective of the player on the influence of motivational levels, education, daily routine, level of practice on sports management and the role of the mediating effect of player preparation, the data has been collected through 754 Badminton players playing atleast at the zonal level across various states of India. The perspective of the players in terms of the responsibilities of coaches and the requirement of specialist trainers has been obtained. The problems faced by the players after the training sessions are summarised.

To sum up, based on the perceptions of coaches, parents and players a sports management framework is proposed. The model can be utilized by sports coaches, sports academies and sports federations to strengthen and improve player preparation programme.

Chapter 1

Introduction

Sports help in building the nation by creating a feeling of national pride and integrity. The nation also gains positive attention for achievements in or hosting of international-level sports tournaments. Sports has emerged as an essential component for the overall development of a nation. Participation in sports activities from an early age has shown a positive impact on health, lifestyle and mental well-being leading to improved overall development and general well-being (Warburton and Bredin, 2017). The contribution of the sports sector to the economy of a nation is manifold: creates employment opportunities, adds to the economic output due to increased commercial events, improves the expected life-span of an individual and promotes a better lifestyle by increasing the income levels (Kokolakakis et al., 2019).

Given the large population and minuscule participation in sports in India, it is critical to increase participation in sports for the improvement of the overall health and productivity of the large population. Further improved participation will also increase the country's success rate in international sports. A large section of the sporting population not only contributes to physical well-being but also contributes to the health index and higher level of economic activity in terms of trade, commerce and industry. The Indian government has made sports outcomes a priority and has taken significant steps in this direction (Varghese, 2018). However, in order to raise the

"medal tally" it is essential to design strategies, frameworks and policies for training, educating, supporting and developing a player that can be successfully applied in the Indian context. This will not only provide international recognition to the country in terms of "medal tally" but also help create a holistic sports ecosystem and encompass issues such as training, education, finance, nutrition, teamwork, and development.

This study seeks to identify specific factors that increase the effectiveness of sports management. Given the limited literature, to add to the existing knowledge, the relationship between the physical fitness of the prospective player, skill set inventory for coaches, parental involvement, player orientation, and sports management needs to be analysed. This would help to attain the goal of effective sports management by examining the perception of coaches, parents and players.

Analyzing the relationship between the physical fitness of prospective players, skill set inventory for coaches, parental involvement, player orientation, and sports management can provide valuable insights into optimizing sports outcomes. These elements warrant explanation.

1. **Physical Fitness of Prospective Players:** Understanding the correlation between physical fitness levels and sports performance is crucial. Factors such as strength, endurance, agility, and flexibility can significantly impact a player's ability to excel in their chosen sport. Analyzing how different fitness levels contribute to performance outcomes can held in developing training programmes and player development strategies.

2. **Skill Set Inventory for Coaches:** This may include evaluating coaching techniques, communication skills, tactical knowledge, and the ability to adapt training methods to individual player needs. Coaches play a pivotal role in player development by providing guidance, instruction, and feedback. Assessing the skills and competencies of coaches can shed light on their effectiveness in improving player performance.

3. **Parental Involvement:** Parents often serve as influential stakeholders in youth sports, providing support, encouragement, and resources for their children's athletic endeavors. Analyzing the extent and nature of parental involvement can reveal its impact on player motivation, performance pressure, and overall development. Understanding the dynamics of parent-player-coach interactions can help create a positive and supportive sports environment.

4. **Sports Management:** Sports management practically includes managing all the issues in sports that are business-related. This includes strategic management, human resource management, organizational hierarchy, leadership, finance management, marketing handling, and performance management. These issues are unique to the management communication of sports organizations. Analyzing the efficiency and effectiveness of sports management practices can identify areas for improvement in facilitating player development, optimizing performance pathways, and fostering a positive sporting culture.

By examining the perception of various stakeholders, including players, coaches, parents, and administrators, researchers can gain a comprehensive understanding of the interconnectedness of these factors and their impact on sports outcomes. This analysis can inform the development of evidence-based strategies and interventions aimed at enhancing player development, improving coaching effectiveness, and promoting positive youth sports experiences.

This research work seeks to suggest how the training schedules must be planned and will guide in dealing with the challenges associated with training for a multi-discipline sport. The main contribution of the work is to propose a framework for sports management in India. The framework would help enhance sports management. The framework can also be used by coaches, sports authorities and sports federations, and other related bodies to improve the process of player preparation and effective management of sports in the nation. This work will also capture the perceptions of

coaches, parents, and players regarding government schemes and financial support to provide guidance for improving the policy and programmes. The inferences drawn from the study would aid sports organizations, coaches, practitioners, and parents in shaping future practices.

1.1 Sports and India

This section presents the organizational structure and sports performance of India at Asian, Commonwealth and Olympic games.

1.1.1 Organisational Structure of Sports in India

There are several governing bodies for monitoring sports activities in India. In 1982 on the eve of the Asian Games, the Ministry of Youth Affairs and Sports was set up by the Government of India. It is divided into two parts including the Department of Youth Affairs and the Department of Sports. The governing structure includes:

1. Sports Authority of India (SAI)
2. National Sports Federation (NSF)
3. Indian Olympic Association (IOA)
4. State Olympic Association (SOA)

These apex bodies guide and monitor the sport's activities in India. The SAI provides financial and infrastructural support while the IOA and SOA are autonomous bodies that provide assistance and support in various global events and tournaments. Apart from governing bodies, there are 56 NSFs recognized by the government to promote sports at the national level in India. Several regional centers and academies come under the SAI.

Despite several initiatives taken by the nation to improve sports in the country, India

is still considered an underperforming nation (Kristiansen et al., 2016). The major concerns in sports are low funding schemes, poor infrastructure, lack of adequate workforce, and poor governance structures and monitoring systems (Clarke and Mondal, 2022).

1.1.2 Sports Performance of India

Table 1.1 presents the year-wise medal tally of the countries in the Asian and Commonwealth Games. The table shows the number of Gold, Silver and Bronze medals won by India along with the percentage of total medals won in the respective games. The highest number of medals were won in the Commonwealth Games hosted in India. The reason for the underperformance of India is indicated by the medal tally in various global sports events.

Table 1.2 presents the year-wise medal tally of the country in the Summer and Winter Olympics games. In the Winter Olympics, India is yet to open the medal tally. The highest number of medals were won in the Summer Olympics held in Tokyo in 2020 from a dismal performance in Los Angeles, Seoul and Barcelona. The percentage of medals won by India in the 2020 Olympics is 0.65.

1.1.3 India and the Olympics

The Olympics is a prestigious sport event that started in 1896 with 14 countries with rise in participation to 206 nations in 2021. Most of the countries participating include the United States, China, Japan, Soviet Union, Great Britain, France, Germany, Australia, Hungary, and Sweden. In the present era, medals at the Olympic games are a benchmark a matter of national pride and a symbol of national strength. Table 1.3 presents the Olympic medal tally of the USA, China, Japan and India. It is shown that the USA has won 2629 medals, China has won 634 medals and Japan has won 497 medals in the Summer Olympics. It is a well-known fact that till date 35 medals

Table 1.1: Sports Performance of India in Asian and Commonwealth Games

Year & Country (1)	Gold (2)	Silver (3)	Bronze (4)	Total 5 (2+3+4)	% of Medals Won (6)
Asian Games					
1982 New Delhi, India	13	19	25	57	9.29
1986 Seoul, South Korea	5	9	23	37	4.27
1990 Beijing, China	1	8	14	23	2.36
1994 Hiroshima, Japan	4	3	16	23	2.14
1998 Bangkok, Thailand	7	11	17	35	2.87
2002 Busan, South Korea	11	12	13	36	2.67
2006 Doha, Qatar	10	17	26	53	3.81
2010 Guangzhou, China	14	17	34	65	4.13
2014 Incheon, South Korea	11	9	37	57	3.93
2018 Jakarta & Palembang, Indonesia	16	23	31	70	4.51
2022 Hangzhou, China	28	38	41	107	6.72
Commonwealth Games					
1990 Auckland, New Zealand	13	8	11	32	5.02
1994 Victoria, Canada	6	11	7	24	3.52
1998 Kuala Lumpur, Malaysia	7	10	8	25	3.74
2002 Manchester, England	30	22	17	69	7.71
2006 Melbourne, Australia	22	17	11	50	7.87
2010 New Delhi, India	38	27	36	101	12.2
2014 Glasgow, Scotland	15	30	19	64	7.77
2018 Gold Coast, Australia	26	20	20	66	7.88
2022 Birmingham, England	22	16	23	61	6.97
Source: https://www.commonwealthsport.com/, https://www.theasiangame.net/ accessed on 17.02.2024					

have been won by Indian players in the Summer Olympics Games. Out of which, 4 in shooting, 3 in athletics, 7 in wrestling, 3 in badminton, 2 in weightlifting, 3 in boxing and 1 in tennis have been won till date. The comparative analysis reveals that the performance of Indian players in the medal tally is not up to the mark which is required to be improved in the future.

Table 1.2: Sports Performance of India in Summer Olympics Games

Year & Country (1)	**Gold (2)**	**Silver (3)**	**Bronze (4)**	**Total 5 (2+3+4)**	**% of Medals Won (6)**
1980 Moscow, Russia	1	0	0	1	0.16
1984 Los Angeles, USA	0	0	0	0	0
1988 Seoul, South Korea	0	0	0	0	0
1992 Barcelona, Spain	0	0	0	0	0
1996 Atlanta, USA	0	0	1	1	0.12
2000 Sydney, Australia	0	0	1	1	0.11
2004 Athens, Greece	0	1	0	1	0.11
2008 Beijing, China	1	0	2	3	0.31
2012 London, UK	0	2	4	6	0.63
2016 Rio de Janeiro, Brazil	0	1	1	2	0.21
2020 Tokyo, Japan	*1*	*2*	*4*	*7*	*0.65*
Source: http://www.olympics.com accessed on 17.02.2024					

Table 1.3: Olympic Medal Tally Data till May-2024

Country (1)	**Population (2)**	**Summer Olympics Medals (3)**	**Winter Olympics Medals (4)**	**Total 5 (3+4)**
USA	335,893,238	2629	330	2959
China	1,425,178,782	634	77	711
Japan	125,819,733	497	76	573
India	1,439,482,317	35	00	35
Source: http://www.olympics.com accessed on 17.02.2024				

1.2 Sports Management – Concept and Importance

Sports management involves skills set that relate to planning, organizing, staffing, directing, budgeting, leading, or evaluating all activities related to a particular sport. It involves dealing with many different professionals across specializations, which vary depending on the sport. A sports manager is the facilitator who develops and improves the sport's team skills to ensure everyone stays on schedule and delivers tasks with benchmarks of global excellence.

Stewart and Smith (1999) suggested a battery of ten particular capabilities of a sport that can assist in understanding why the management of sport requires applying spe-

cific management techniques. A significant part of sports is the development of a passion for sporting teams, players or tournaments amongst populations. Sport has a remarkable importance in performance, winning and celebrating an achievement that does not arise in different regions of financial and social activity. The maximum enterprise environments aim to stabilize the most crucial marketplace share, defeat all competition, and stabilize a monopoly.

India is growing as a catalyst for the sports industry. Due to the rising number of sports confederations, increasing from a broad extent of sports like Cricket, Badminton, Hockey, Kabaddi, Boxing, Tennis, etc., many job opportunities may arise in the sports management sector in India. In addition, India has been designated as a vital contestant in the global sports marketplace and is expected to bring newer global accomplishments.

Further, sports has influenced in shaping experience, and management. Many governments see sports as a channel for nationalism, financial growth, or social progress. Parks et al. (2007) opined that most countries encourage highly proficient training establishments to support the development of sportspersons for national and international competition, offer subsidies to national sporting establishments, support sports organizations to bid for major events, and support building key stadiums. Consequently, governments can expect sports to employ a large number of participants, provide amenities to distinct community sectors, or have sports endorsement guidelines on the usage of alcohol and drugs, betting, and general health promotion communications.

The management of sports has experienced comparatively rapid professionalization over the last three decades. Globalization has been a critical force in transforming sports. The greater integration of the globe's economies has empowered communication between creators and consumers at superior speed and diversity; thus, sports has been one of the sectors to gain profits. The general development of the international sports industry and commercialization of sports tournaments and competitions, jointly with the beginning of paid personnel into voluntary power organizations and the

increasing number of individuals who manage their living costs by either managing or playing sports, has forced sports management to be more professional. This is manifested in the augmented university sport management courses and the requirement to have professional skills and industry-explicit knowledge or practice to succeed in sports management (Parkhouse, 2005).

1.2.1 Player Preparation for Sports Management

Competitive player preparation involves factors such as the physical attributes of the player, the skill set of the coach, parental involvement and player orientation. For this, a team of experts must be constituted to work on the physical, emotional and technical aspects of a player.

1.2.1.1 Coach, Parent & Player

In the development of a successful player, multifold efforts are required by coaches along with the efforts of the player. The player's physical fitness is required to improve their motor abilities which leads to better athletic performance. Physical factors need proper attention at an early age of players, such as flat feet and knocked knees. Flat feet and knock knees lead to severe problems in pursuing sports of choice, as the person with flat feet and knock knees would not be able to go beyond a certain level. It needs proper planning, especially in education, to make children, parents, and teachers aware of the problem of flat feet and knock knees.

The coach plays a vital role in the player's development. A coach must have special characteristics like an understanding of the sport, eagerness to impart his/her knowledge, and the penchant of a teacher to educate the players. Awareness of individual differences in players is an essential ingredient in coaching excellence. Every player has a different skill set as per player's body type, flexibility, agility, endurance, and strength. A coach understands these differences and tries to enhance each player's

skill set with the help of supporting staff. The role of a coach in building a player is extremely important.

From the very first moment of entrance into sports to the time of their achievements, parents have a profound influence on their children's sports careers. This influence of parental support, both emotional and financial, is visible in the progress and achievements of the player. This is to ensure that the young player keeps his/her high involvement to achieve his full potential. However, when this support is missing or wanting, it can result in stress, conflict between parents and children, burnout, and may lead to dropout. Parental involvement in providing emotional and financial support is essential in improving physical activity to promote life satisfaction levels (Zuo et al., 2022). Thus, the role of coaches and parents in the preparation of a player cannot be ignored while aiming at creating an effective framework for sports management.

1.2.2 Training Attributes in Sports

The enhancement and management of fitness attributes such as agility, flexibility, endurance and strengthening increase the performance of players in all types of sports (Bashir et al., 2019; Savla et al., 2020). Agility training improves quickness in transiting from one movement to another, flexibility training improves range of motion, endurance training enhances the ability of muscles to perform muscle contractions for a longer period and strengthening training improves muscular strength. The advantages of improving these attributes include improvement in balance, movement, posture, speed, anaerobic capacity, strength, and a decrease in the risk of injury (Pamungkas et al., 2022; Ratamess, 2011). Figure 1.1 shows the training attributes of a player.

In order to prepare effective players and increase the medal tally, it is important to effectively manage the coach education programmes (Cushion et al., 2003), the experience of coaches in international and national tournaments and having specialists

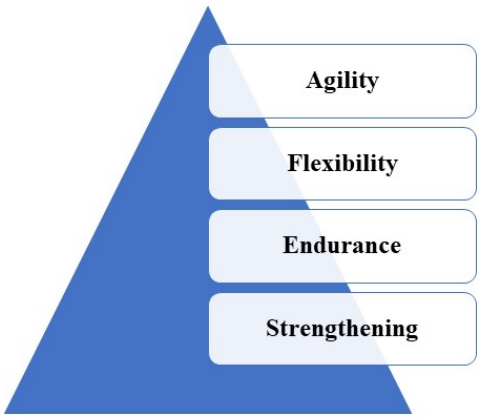


Figure 1.1: Training Attributes of a Player

to efficiently supervise the training of players with a specific focus on agility, flexibility, endurance and strengthening of players. This will lead to effective sports management.

1.2.3 Characteristics of a Player

Figure 1.2 shows the essential characteristics of a successful player. The important factors include physical fitness, skill set, motivation, tactics, movement, speed, decision making, time management, and mental health. The training of player includes physical, psychological, technical, tactical and intelligence training. Physical fitness is essential for every player and plays a vital role in player preparation as a player with good technical skills but with improper physical fitness will not be able to produce good results (Xu, 2015).

Thus, a well-prepared fitness routine considering agility, flexibility, endurance and strengthening (refer to section 1.3.2) must be followed by a player. Similarly, nutrition has been recognised as a key component for the optimal sports performance of

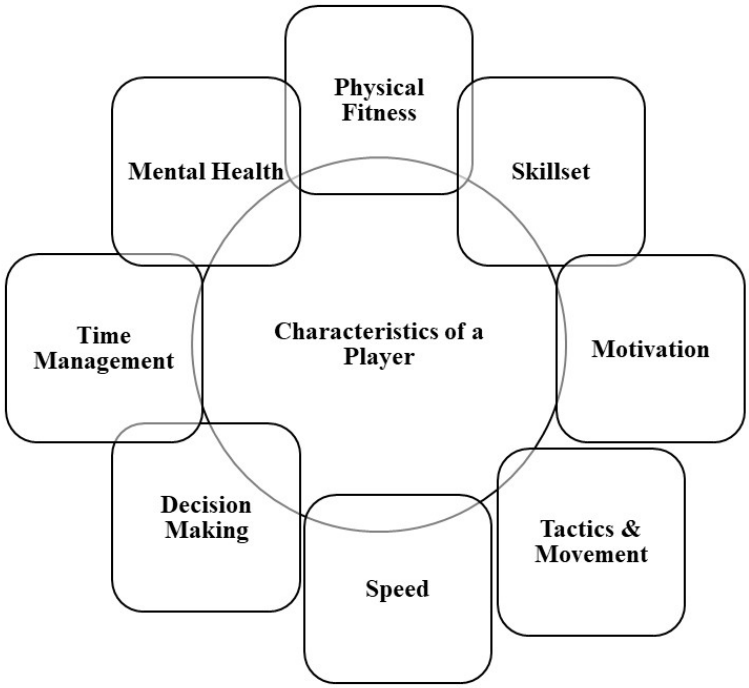


Figure 1.2: Key Characteristics of a Player

players (Beck et al., 2015). Optimised dietary strategies including proper intake of fluids, micronutrients, macronutrients and their proper balance, throughout the day, is significant for the performance enhancement of a player (Beck et al., 2015; Wright et al., 1991). Thus, it is essential to have a nutritionist who can plan and manage the proper nutrition plans of the players.

1.2.4 Importance of Badminton Sport

Badminton sports is gaining popularity day by day and is played by more than 300 million people in almost every country (Pamungkas et al., 2022). Badminton sports is a game based on net that is played with a one-handed racket consisting of either two (singles) or four players (doubles). The below sections provide a historical perspective of Badminton sports and the rationale behind including Badminton in this work.

1.2.4.1 Historical Perspective

The importance of Badminton as a sport increased after the 1992 Summer Olympic games where it debuted with four events (Manrique and Gonzalez-Badillo, 2003). In the Olympic games, India has won 1 silver and 2 bronze medals in Badminton to date. India has won 3 gold, 1 silver, and 1 bronze medal in Badminton at the Commonwealth Games. Badminton is a sport that requires a high level of performance and the physical characteristics of the players. The characteristics of Badminton sports involve agility, flexibility, endurance, strength, technical skill, precision, footwork, mental alertness, rapid arm movements and sporadic movements with high-intensity levels (Phomsoupha and Laffaye, 2015). Thus, mental well-being and effective preparedness are essential in Badminton sports. (Bashir et al., 2019).

1.2.4.2 Rationale for Including Badminton in this Study

The current study focuses on Badminton as a sport. Hence, in this study, the perceptions of coaches, parents and players participating in Badminton sports are taken into account. This is due to the fact given above that this sport demands high performance levels and physical characteristics including maintenance of speed, balance, posture, coordination, reaction, endurance and technical skills (Manrique and Gonzalez-Badillo, 2003). Further, it requires much more quickness, flexibility and strengthening as compared to other sports. Hence, this sport demands excellent fitness. The enhancement and management of fitness attributes such as agility, flexibility, endurance and strengthening will increase performance in all varieties of sports.

1.3 Literature Review

In this section, we provide the current state of research on the physical attributes of a player, coach skill set, parental involvement and player orientation.

1.3.1 Physical Attributes of a Player

In this section, the studies in the literature based on flat feet and knock knees are summarized (Askary Kachoosangy et al., 2013; Chang et al., 2010; Daneshmandi et al., 2009; Eluwa et al., 2009; Ganeb et al., 2021; Karimi-Mobarake et al., 2005; Pashmdarfard et al., 2019; Pourghasem et al., 2016; Rasheed and Pagare, 2015). Mobarake et al. (2005) analysed 3000 primary Iranian school children aged 7-11 years and found that knock knees were more prevalent in girls than boys. Daneshmandi et al. (2009) analysed 1180 high school students aged between 12 to 15 years. The results showed that obesity caused flat feet. Eluwa et al. (2009) analysed 1000 students aged between 20 to 30 years and concluded that flat feet were more in female students than in males. Chang et al. (2010) examined 2083 children aged 7 to 12 years and found that children who were obese were more likely to have flat feet. In the study by Vergara-Amador et al. (2012), 940 school children aged 3 to 10 years were examined and the results showed that flat feet were related to age, city, body mass index (BMI) and gender). Kachoosangy et al. (2013) analysed 945 school children aged 7 to 12 years and using the chi-square test it was found that there was no significant relationship between gender and age with flat feet. The study assessed 474 school children aged between 6 to 10 years and it was found that one in every five children was detected with flat feet and obesity had a positive relation with flat feet. In the study by (Bhoir, 2014), 80 students aged 18-25 were examined and no correlation between gender and BMI could be established. Rasheed and Pagare (2015) assessed 25 school children and found 32% of children were diagnosed with knock knees. In the study by Sadeghi-Demneh et al. (2015), 667 school children between 7 to 14 years of age were examined and results depicted a significant correlation of age and weight with flat feet. In the study by Jankowicz-Szymanska and Mikolajczyk (2016), 1364 children between 5 to 7 years were examined and a significant correlation between BMI was found with flat feet and knock knees. Pourghasem et al. (2016) analysed

1158 school students and found there was a significant relationship between obesity and flat feet. Pashmdarfard et al. (2019) examined 1700 school children of 7 to 12 years of age and found that weight was a significant predictor of flat feet. In the study by Al-shenqiti et al. (2020), 563 children aged between 6 to 12 years were assessed and it was detected that no significant correlation between weight and gender with flat feet exists and there is a significant correlation between age and height with flat feet. Ganeb et al. (2021) examined 4689 children aged 6 to 12 years and concluded that early examination and screening are essential in school children.

There are no Indian studies found in the present literature that evaluate the presence of flat feet and knock knees amongst school children and also very few studies exist in total that evaluate the presence of knock knees amongst school children.

1.3.2 Impact of Coach Skill Set on Player Preparation

A few studies have examined the relationship between coaches and players with the help of a questionnaire (Jowett and Ntoumanis, 2004; Trudel et al., 2010; Lisinskiene, May and Lochbaum, 2019; Quinaud et al., 2022). In the study by Jowett and Ntoumanis (2004), 214 British participants (35% of coaches and 65% of players) showed that closeness, commitment and complementarity were essential components in the coach-player relationship. In the study by MacDonald et al. (2010), 109 players were surveyed. The results showed that the players who played under trained coaches demonstrated higher personal and social skills as compared to the players whom untrained coaches trained. The coach's perception of the training programmes was observed, and it was concluded that the coaches reported a better understanding of players and increased knowledge. Falcão et al. (2012) opined that the coach training programmes would be effective in the promotion of youth sports outcomes. Eather et al. (2019) showed improvement in coaching practices. In the study by Falcao et al. (2020), 148 school student-players (12 and 17 years), including trained and untrained

coaches were interviewed. The study revealed that humanistic coaching can improve the development outcomes of players.

1.3.3 Parents' Involvement and Orientation towards Sports

Zuo et al. (2022) concluded that there was a positive effect of a supportive parent environment on the life satisfaction level. Further, the study found that by improving physical activity, life satisfaction levels may improve indirectly. Keeping this in view, parental support in improving the efficiency of a child is essential and should be evaluated.

Park and Kim (2014) surveyed 20 players and found that emotional support and esteem support were less effective. Furthermore, the player's emotional status may be enhanced by an increase in social support. The study carried out by Verloigne et al. (2014) concluded that parental support has a positive impact on physical activity by reducing the perceived internal barriers of players. In the study by Kaur, Kapur, and Singh (2015), an evaluation of the parental involvement scale and self-esteem scale was conducted, and it was found that the involvement of parents with females was more as compared to males. It was also found that self-esteem and parental involvement were independent (Arshdeep et al., 2015). In the study carried out by Bibi et al. (2016), it was concluded that most players faced parental issues, including financial, motivational, and attitude problems. In the work by Dorsch et al. (2017) it was shown that parents who participated in the sports seminar demonstrated more warmth and support than those who did not. The results found by Teques et al. (2018) confirmed the impact of parental involvement and motivation on player's performance in sports. In the study carried out by Lev et al. (2020), 173 basketball players were evaluated and the results showed that the players appreciated the parent's greater involvement. Emotional support was found to be one of the essential components in the performance of a player. Arribas-Galarraga et al. (2020) showed that there

is a mediation effect of perceived fitness between self-efficacy and sports practice. Bonavolontà et al. (2021) emphasized that excessive parent involvement may lead to pressure amongst players. Lian et al. (2021) found that family sports attitude has a positive impact on children' sports participation. Azimi and Tamminen (2022) enlightened the parents about reflective practice in order to educate the parents on the role of parents and the communication process.

1.3.4 Player Orientation Towards Sports Management

In the study carried out by Fortes et al. (2010) it was revealed that academic motivation, student athletic motivation, and career motivation are essential factors in improving students' academic performance. The study also emphasized educating students in schools and universities about developing sports as a career option. In the study by Kırkbir (2017) it was shown that mental imagery has a positive effect on player achievement. Bashir et al. (2019) observed an improvement in players who had undergone a core training programme in dynamic balance and agility.

Röthlin et al. (2016) concluded that psychological skills training and mindfulness-based intervention improve functional behavior in players. Keshtidar and Behzadnia (2017) concluded that the intention to continue in sports amongst players has a positive relationship with both goal orientation and motivation. In the study by De Francisco et al. (2018), it was shown that psychological needs satisfaction has a positive impact on player engagement and the relationship is mediated by players' self-motivation. In the work carried out by Shang and Yang (2021) it was shown that social support prevents player burnout with the meditating effects of mental toughness and sports motivation. In the study by Glandorf et al. (2022), the authors concluded that perceived support reduced stress and thus the risk of player burnout development. Amaro et al. (2023) showed that the relationship between task-involving climate and enjoyment is mediated by self-determined motivation.

1.3.5 Research Gap

The literature review carried out above reveals that the problem of poor performance in various sports events has become a severe cause of worry and a topic of boardroom discussions. Previous studies have independently examined the variables, including parental contribution to player development and coaching effects on player performance. Some researchers have examined psychological parameters like competitive anxiety and sports orientation but performing an exhaustive literature review, the outcome suggests that limited literature is available in the Indian context regarding the identified variables. Identifying and addressing research gaps is essential for advancing knowledge in any field thus the current research aims to fill this gap.
Besides, all studies are missing the essential aspects of holistic sports management, which is the backbone of any sport's player development. This work focuses primarily on the design of a sports management framework in the context of player development in Badminton sports.

1.4 Objectives of the Study

The study seeks to address the growing problem of player ineffectiveness in these current times by developing a contextual understanding of how various factors, including player orientation, coaches' skill set, and parental involvement, influence sports management. To achieve this, the following are the objectives of the study:

- To identify the physical attributes, flat feet & knock knees in primary school children.
- To identify the influence of the coach skill set inventory on sports management.
- To identify the parental involvement towards sports management with player preparation as a mediating variable.

- To identify the player orientation towards sports management with player preparation as a mediating variable.
- To develop a conceptual framework for sports management.

1.5 Research Framework

The model given in Figure 1.3-1.5 depicts the proposed research framework. The relationship between age, gender, weight and the presence of flat feet and knock knees is depicted in Figure 1.3. Figure 1.4 depicts the relationship between the skill set of coaches and sports management. Figure 1.5 indicates the relationship between parental involvement and player orientation with sports management keeping player preparation as a mediating variable. The skill set of sports coaches, parental involvement and player orientation will have a significant association with sports management, and the relationship is mediated by player preparation strategy. The skill set of the coach is measured in terms of education, experience and training attributes (agility, flexibility, endurance and strengthening). Parental involvement is measured in terms of emotional, financial and social support. The player orientation consists of constructs including daily routine, education, level of motivation and level of practice. The framework will provide a more profound and deeper understanding of the mechanism, which will lead to sports management in the current scenario and will be helpful for the sports federations to improve the performance of players. The conceptual framework presented will be evaluated and assessed in this work.

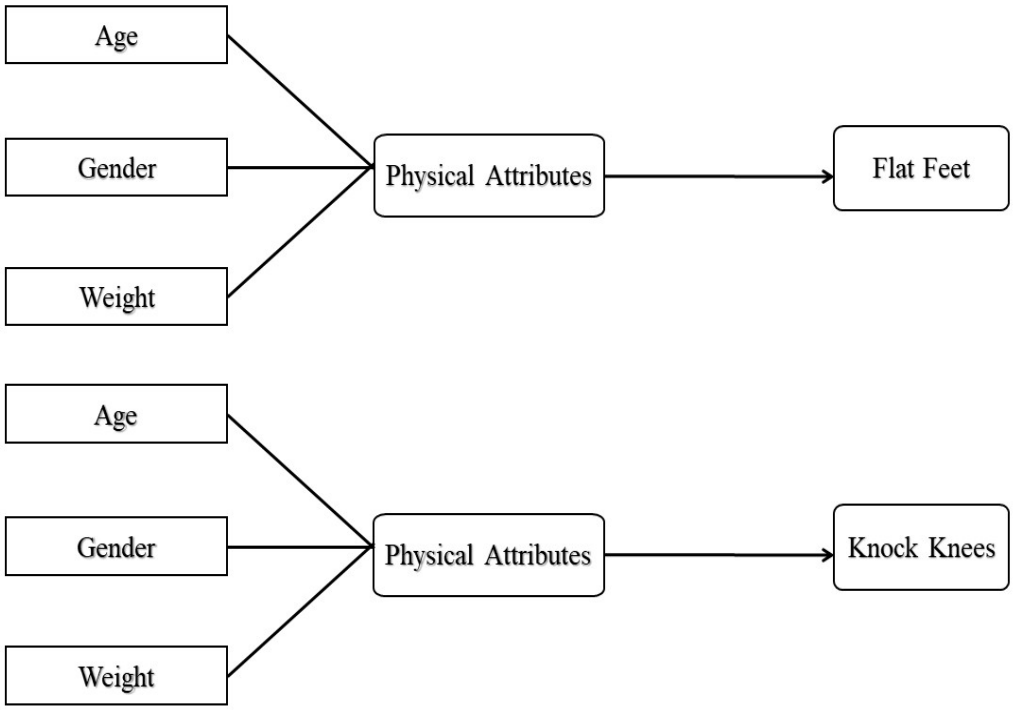


Figure 1.3: Conceptual Framework for the study on the Physical Attributes namely, Flat Feet & Knock Knees

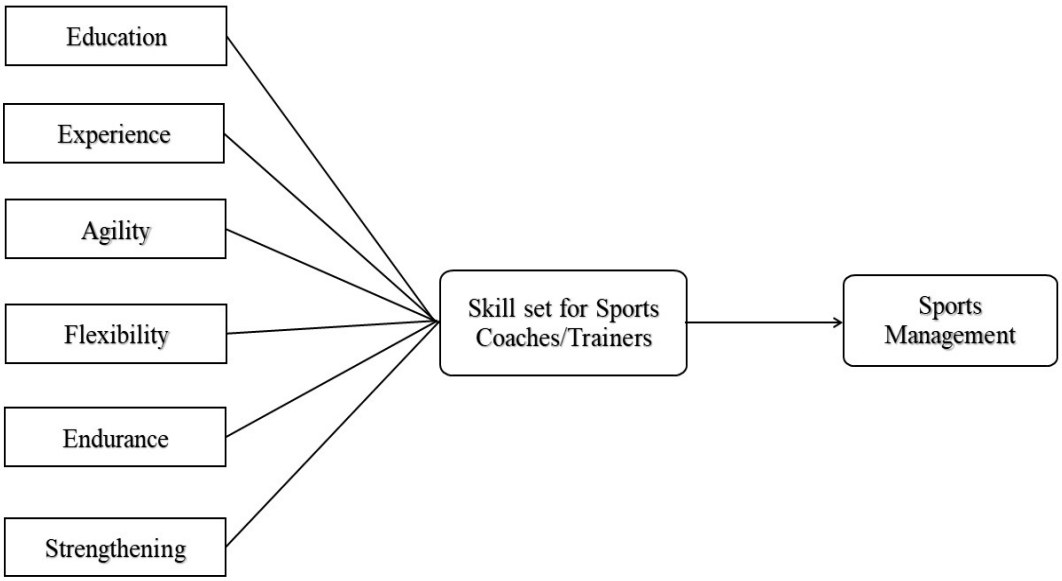


Figure 1.4: Conceptual Framework for Study on Coach Skill Set for Sports Management

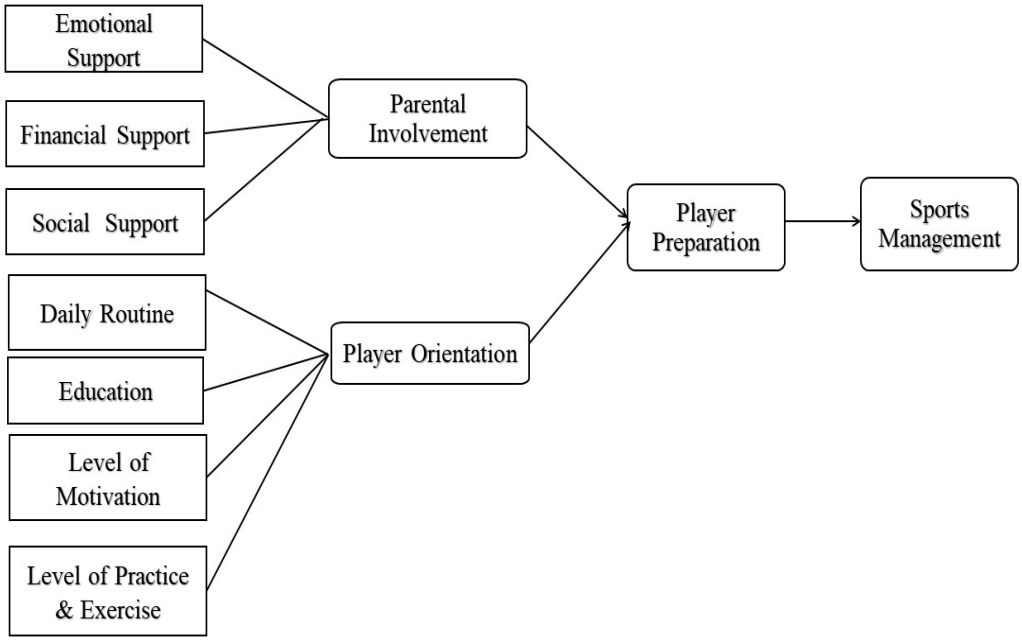


Figure 1.5: Conceptual Framework for the Study on Player's Orientation, Parental Involvement and Player Preparation for Sports Management

1.6 Rationale of the Study

A framework for sports management is essential for producing efficient players and will be helpful for the sports authorities in improving player's performance outcomes. In order to create and develop an effective framework for sports management, it is necessary to obtain feedback regarding various aspects such as physical preparation, tactical preparation, emotional support, financial support, nutrition management and so on from key stakeholders namely coaches, parents and players.

The absence of a strong scientific foundation poses challenges in defining and describing sport management. The importance of research in developing sport management is a distinct academic field.

After a thorough evaluation of the literature review four key players are identified in sports management as follows 1) Physical Attributes such as Flat Foot and knock knees 2) Coach, 3) Parent 4) Player. It is the need of the hour, that a systematic and

well-defined framework and methodology must be adopted for sports management since it is currently conspicuous by its absence.

Through this study, an attempt has been made to contribute to building this foundation, which can help establish theories, frameworks, and methodologies specific to the field. This, in turn, can enhance understanding, promote, informed practice, and contribute to the overall development and legitimacy of sport management as a discipline.

1.6.1 Scope of the Study

The scope of the study is given below:

- Physical fitness of a player plays an important role in the outcome of the sport. Hence this study would include a focus on elements of the structural level that impede the performance that are flat feet and knock knees.
- Coaches in India are perceived to take charge of the overall components of players' development, including physical training, health and nutrition, counseling, and other factors. Therefore, the skill set of the coach will be considered while developing the framework for sports management.
- Some parents in India view sports as a recreational activity or hobby instead of a career option. Therefore, parental involvement is yet another element that will be incorporated.
- Players in India need to be trained with well-designed educational and training programmes. In addition to field training, they should be well aware of the theoretical and practical aspects, including sports education, professional orientation, nutritional awareness and psychological aspects. Hence, this study incorporates the perception of the players.
- This work captures the perception of coaches, parents and players pertaining to Badminton sports as specified in section 1.2.4.

1.7 Organization of Work

Besides the introductory chapter, the thesis spans over 7 chapters. Chapter 2 summarises the findings of studies focusing on techniques for the effective performance of Olympic players. Chapter 3 presents the research methodology in this work followed by chapter 4 describing the prevalence of flat feet and knock knees among primary school children between 6 to 10 years of age. Chapter 5 expands on the relationship between a coach's skill set and sports management. In chapter 6, a questionnaire for collecting the perspective of parents of badminton players is designed and validated. Chapter 7 analyses the responses of players for improving the sports management process. This chapter proposes a framework for sports management. Chapter 8 summarizes the major conclusions and implications of the thesis. The chapter-wise summary of the work is presented below.

Chapter 2 presents the review of literature using data from various countries across the world focusing on providing strategies and techniques for the successful performance of Olympic players. The studies analysing the performance of the existing Olympic players are taken into consideration. The work provides guidelines for improving the performance of players in the Olympic Games. Further, the positive and negative factors affecting a player in the Olympic tour are extracted and listed.

Chapter 3 describes the questionnaire design and data collection technique used in the present research work. The research procedure followed in this work is presented and the steps for questionnaire validation are also explained in this chapter.

Chapter 4. The prevalence of flat feet and knock knees is a result of postural deformity or incorrect posture that can be corrected, if taken care of at an early age. If these postural deformities are not dealt with at an early age, they can hamper the quality of life and restrain children from participating in many sports activities. The main aim of the chapter is to find the prevalence of flat feet and knock knees among 1590 primary school children between 6 to 10 years of age. The relationship between demographic

factors such as age, gender and weight with flat feet and knock knees among primary school children are also analyzed.

Chapter 5. This chapter, presents the questionnaire on the skill set of the coach. The focus of the questionnaire is on the importance of physical education, agility, flexibility, endurance and strengthening in player preparation and their relation with sports management. The data was collected from 82 coaches in badminton sports across various states of India. The study analyzes the coach's perspective on the importance of the education of coaches and its effect on sports management. The study examines the importance of four important player attributes namely agility, flexibility endurance and strength from the coach's perspective.

Chapter 6. This chapter portrays the data collected from 314 parents whose children participated in badminton sports at least at the zonal level across various states of India. The validation of the responses to the questionnaire was done using reliability analysis. The questionnaire focuses on the emotional, financial and social support provided to players and its relation with sports management with a mediating role of player preparation. The need for dedicated specialist trainers was voiced by the parents. Also, the adequacy of financial grants provided to the player is an area of concern expressed by the player's parents.

Chapter 7 This chapter presents the results of a survey of 754 Badminton players to gather their views on the influence of motivational factors, education, daily routine and practice level on player preparation and sports management. The mediation effect of player preparation between daily routine, education, level of motivation, level of practice and sports management is analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. This chapter assesses the player's perceived requirement of specialist trainers in various areas and summarises the problems faced by players after retirement from the training sessions and their future plans after sports for financial sustainability.

Sports management is essential for facilitating and improving the activities of player

preparation. In this chapter, a framework for sports management is proposed. The framework proposed in this study will help coaches, sports academies, sports authorities and other related bodies to improve the process of player preparation and effective management of sports in the nation.

Chapter 8. The last chapter of the thesis presents the conclusion of the research and future guidelines for policy makers at the level of government and sports federations.

Chapter 2

Performance in Olympic Games and Literature Review

2.1 Introduction

This study aims to review the performance of the nations winning the highest number of Olympic medals so that future strategies can be proposed for Indian players in the Olympic games. It involves improving the training facilities, mental health, family support, psychological factors and so on. Hence, in this study, we present the historical perspective of the Olympic games and review existing studies to provide strategies for improving the performance of players in the Olympic games by taking guidelines from leading countries. The chapter summarises the attributes of a successful player, suggests guidelines for Indian players for the Olympic games and provides directions for future research. The chapter aims to (i) provide an analysis of historical Olympic data (ii) study and summarize the performance strategies of Olympic players (iii) identify and extract the factors and subfactors positively and negatively influencing the success of an Olympic player and (iv) derive and provide future guidelines for improving the performance of players. The results of this chapter along with the results of subsequent chapters will serve as a basis for suggesting a framework for sports

management in India. Further, the results will provide future directions to researchers and academicians for conducting studies leading to improved sports management processes in developing nations.

The rest of the chapter is organized as follows: Section 2.2 presents the sports management perspective and historical perspective of the Olympic games. Section 2.4 presents a summary of existing studies providing strategies for improving performance in the Olympic games. In section 2.5 future guidelines for Indian Olympic Games have been summarized and section 2.6 presents the conclusion of the work.

2.2 Sports Management: A Perspective

The management of sports involves planning and coordination with agencies and federations and activities to prepare world class performance by sportsmen. This assumes two elements, one dealing with the performance and the second aspect requires a review of questions relating to player development, parental support and coach skill set. For this, the chapter is divided into two parts. Part one deals with the analysis of performances at Olympic games and the second part deals with the literature review to identify the research questions and extract their answers.

2.3 Olympic Games: Historical Perspective

This section presents an analysis of the Olympic data from International and Indian perspectives.

2.3.1 Olympic Games: International Perspective

The Olympic games are the most prestigious and largest international event in the world (Frawley and Adair, 2013) that feature both summer and winter sports competitions every four years. The modern Olympics began in 1896 in Athens, Greece.

The International Olympic Committee (IOC) is the governing body of the Olympic games founded in 1894. In the recent summer and winter Olympic games 206 and 109 countries participated, respectively. Figure 2.1 presents the Olympic games hosted by a number of countries. The bar chart shows that the United States has hosted the Olympic maximum number (9) of times till date followed by France, Italy and Japan in that order. India has not hosted any of the events of Olympic games.

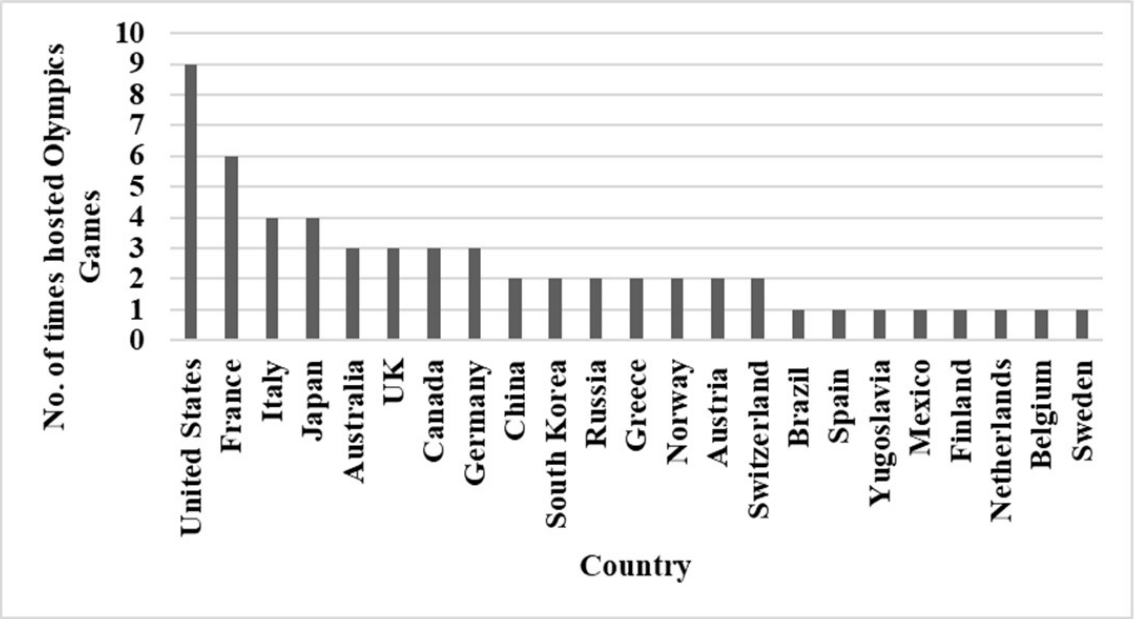


Figure 2.1: Countries hosting Number of Times Olympic Games

In yester years, there has been growth in the number of events, countries and participation of players in the Olympic games. Figures 2.2 and 2.3 analyse the rate of growth of the Olympic games (1984-2020) in terms of countries, sports, events and number of participating players in summer and winter sports. The analysis of data reveals that the 1984 summer Olympic games held in Athens, Greece had the participation of 140 countries, 23 sports, 221 events and 6829 participating players in comparison to the 2020 Olympic games held in Tokyo, Japan with 206 countries, 26 sports, 206 events and 11656 participating players. In the 1984 Winter Olympics, there were 49

participating countries, 6 sports, 39 events and 1272 participating players in comparison to the 2022 Olympic games which consisted of 91 countries, 7 sports, 109 events and 2861 participating players. It can also be seen in the graph that the number of participating countries, number of sports, number of events and participating players are far greater in summer Olympics as compared to the Winter Olympics.

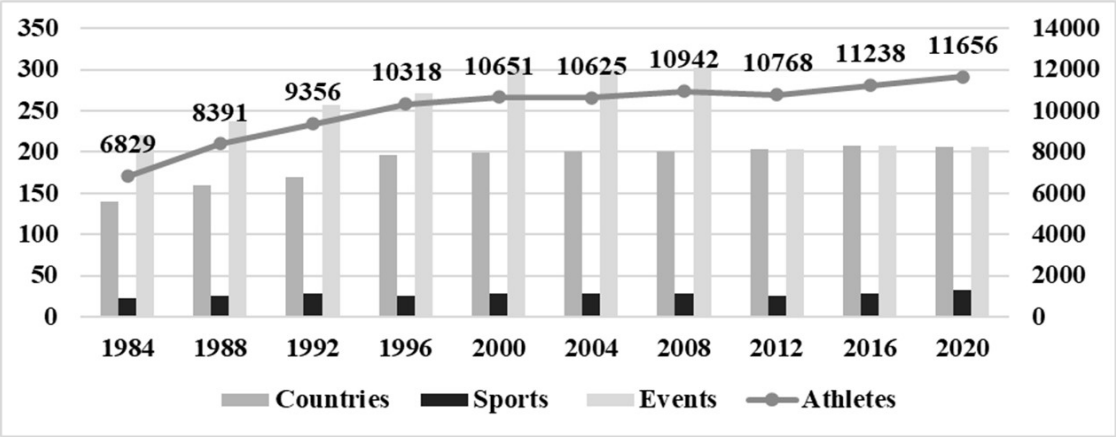


Figure 2.2: Statistics of Summer Olympics Games (1984-2020)

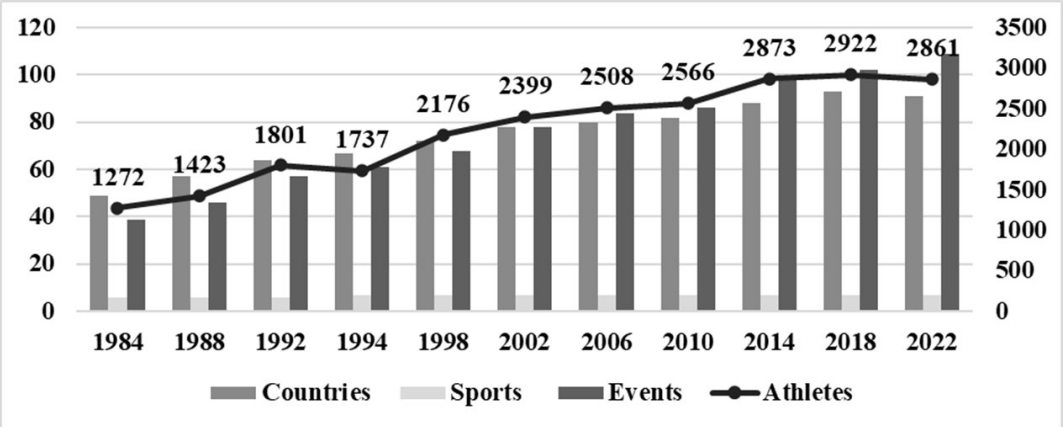


Figure 2.3: Statistics of Winter Olympics Games (1984-2022)

The International Olympic Committee (IOC) states that ”sport is one of the most powerful platforms for promoting gender equality and empowering women and girls”. No women competed in the 1896 Athens Olympics. The first women's participation was achieved in the 1900 Paris Olympic games, since then women's participation has been growing in the Olympic games. From figures 2.4 and 2.5, it can be seen that there has been significant growth in women's participation in the Olympic games over the past 30 years. There were about 22.9% of women participating in the 1984 Olympics games. The percentage has increased to 48.7% in the 2020 Olympic games.

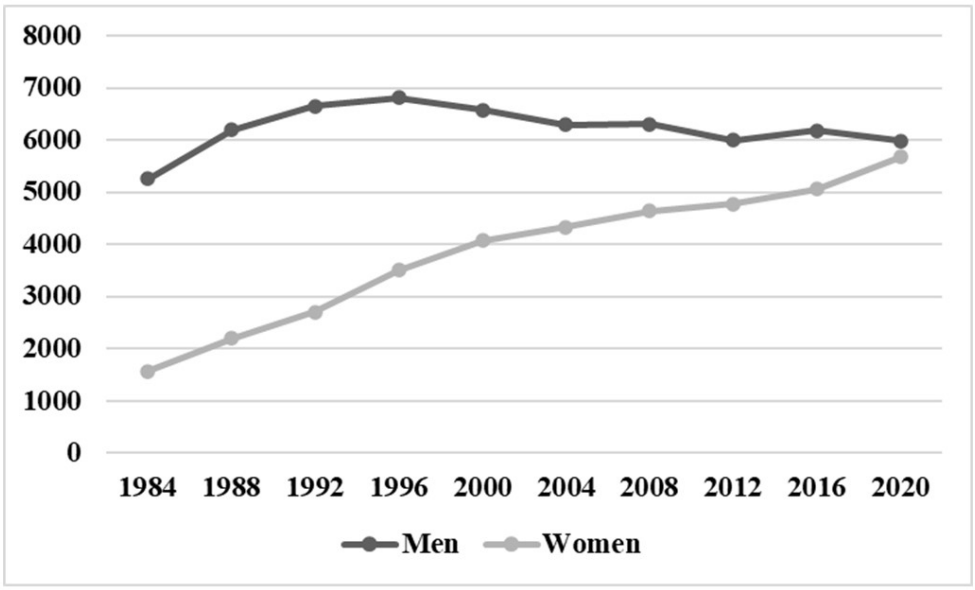


Figure 2.4: Growth of Men & Women in Summer Olympics Games (1984-2020)

The total number of gold, silver and bronze medals received by the top 10 countries in the summer Olympics from 1896 to 2020 are analysed and shown in figure 2.6. The count includes the medals won by an individual or a team in the Olympic games. The analysis shows that the United States (US) is the top most country in the medal tally of the summer Olympic games and has received 2636 total medals including 1061 gold, 836 silver and 739 bronze medals.

The total number of gold, silver and bronze medals received by the top 10 countries in

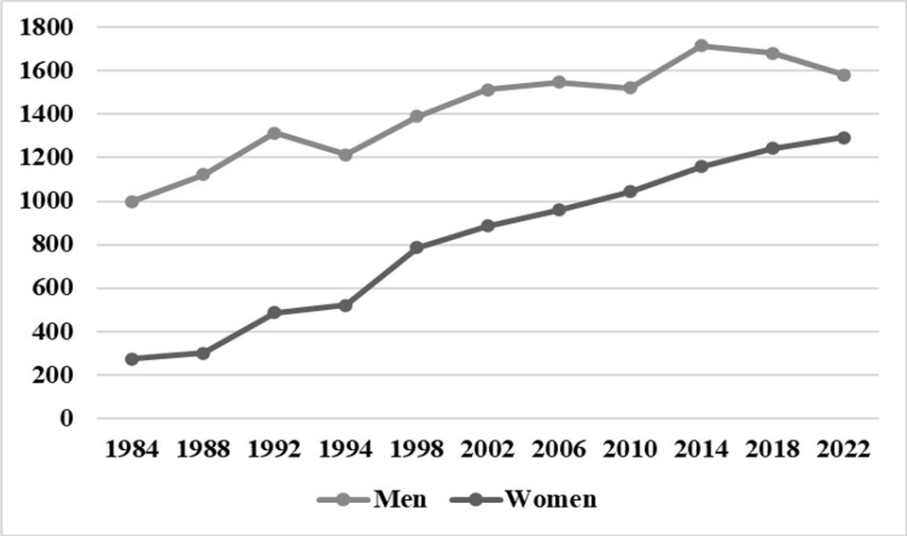


Figure 2.5: Growth of Men & Women in Winter Olympics Games (1984-2022)

the Winter Olympics from 1896 to 2022 are analysed and shown in figure 2.7. The count includes the medals won by an individual or a team in the Olympic games. The analysis shows that Norway is the topper country in the medal tally of the Winter Olympic games with 405 total medals including 144 gold, 133 silver and 124 bronze medals.

Figure 2.8 presents the top 10 players winning the highest number of medals in the history of the Olympic games. The graph shows that Michael Phelps during 2004-2016, representing the United States, received the highest number of medals (23 gold, 02, silver and 1 bronze) in the summer Olympic games in swimming. The next two in the tally of the highest number of medals are female players Larisa Latynina during 1956-1964, in the Summer Olympic games representing the Soviet Union, with 18 medals in Gymnastics and Marit Bjørgen during 2002-2018 in the Winter Olympic games, representing Norway, with 15 medals in Cross-country skiing.

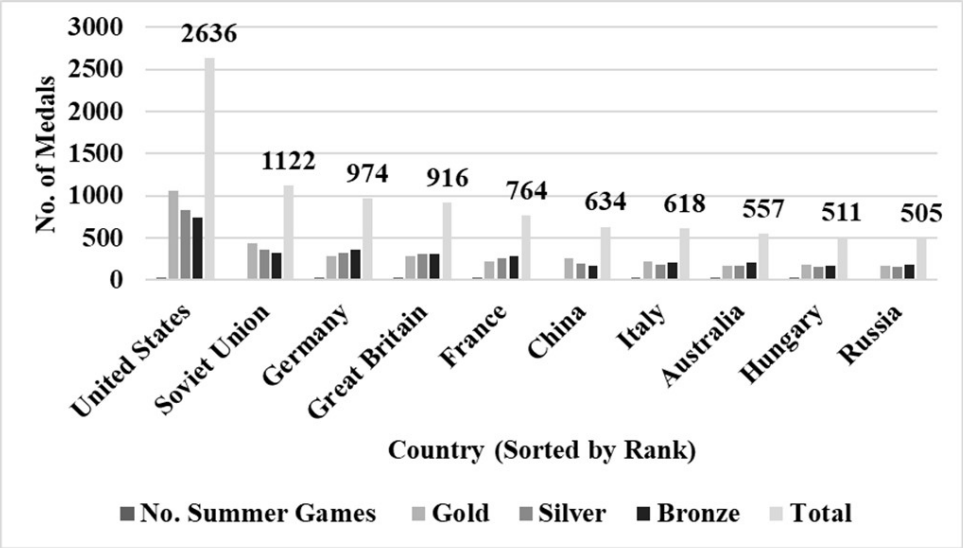


Figure 2.6: Top 10 Countries Ranked by No. of Medals in Olympic Summer Games

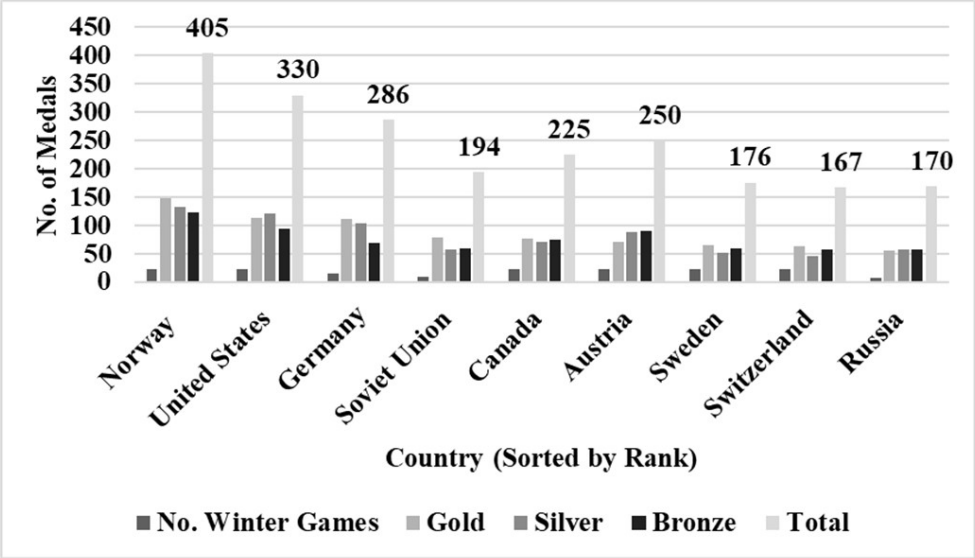


Figure 2.7: Top 10 Countries Ranked by No. of Medals in Olympic Winter Games

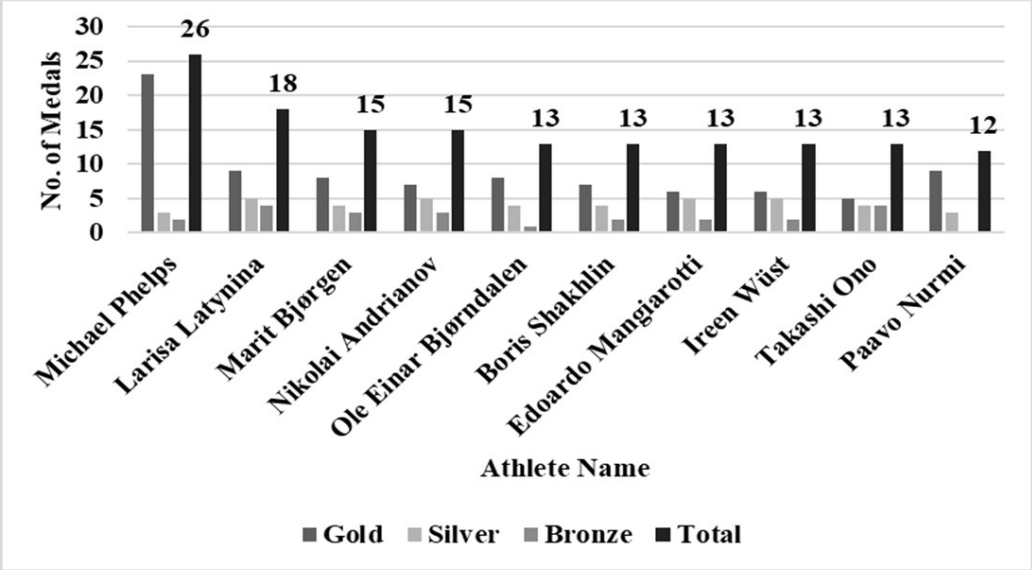


Figure 2.8: Top 10 players in Olympic Games with regards to Number of Medals

2.3.2 India at the Olympics

In this section, an attempt is made to analyse the summer and winter Olympic games data with respect to India. India first participated in the Olympic games in 1900 in Paris. A total number of 35 medals have been won by the Indian players in summer Olympic games. No medal has been received by the Indian players in Winter Olympic games. Figure 2.9 depicts the number of medals received by the Indian player with respect to year. There were 2 medals received in 1900 Olympic games and 7 medals have been received in 2020. The increase in medal tally is not significant and is only seen in the individual events. In addition, there are only a few repetitive success stories (the same player getting a medal in the Olympics) in the Olympic games. Hence, there is no consistency shown by players in winning the medals.

Figure 2.10 presents the number of gold, silver and bronze medals received by the Indian team in the Olympic Games. There have been 10 gold medals (8 in hockey, 1 in shooting, 1 in Athletics), 9 silver medals (1 in hockey, 2 in shooting, 2 in wrestling,

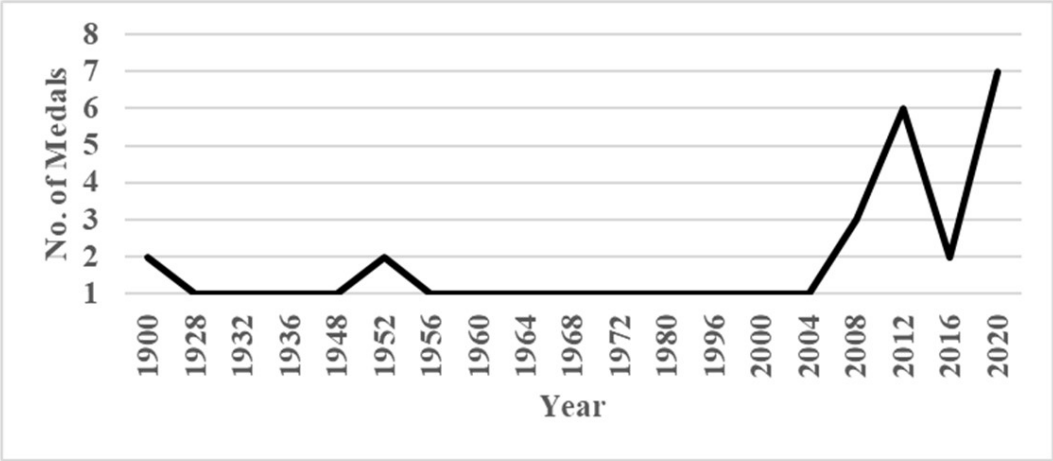


Figure 2.9: Number of Medals Received by Indian players in Olympic Games

1 in badminton, 1 in weightlifting) and 16 bronze medals (3 in hockey, 1 in shooting, 5 in wrestling, 2 in badminton, 1 in weightlifting) received by the Indian players in Olympic games.

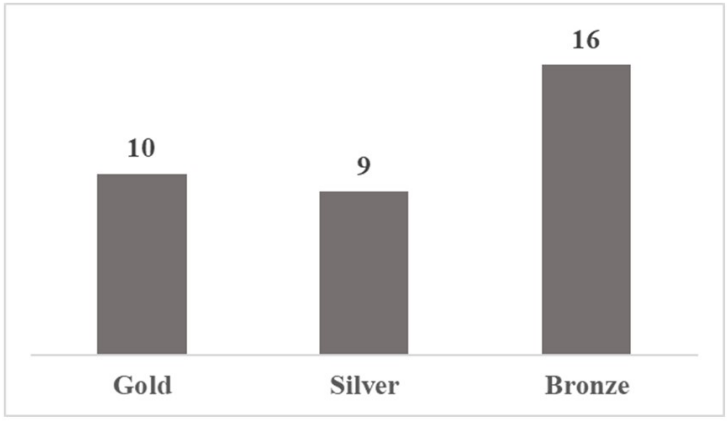


Figure 2.10: Number of Gold, Silver and Bronze Medal received by India in Olympic Games

Figure 2.11 presents the number of Olympic medals won by the Indian players in team and by individual players. The graph shows that there are 12 medals (8 gold, 1 silver and 3 bronze) received by Indian players in team sports and 23 medals received by Indian players in individual sports. In figure 2.12, an analysis of the

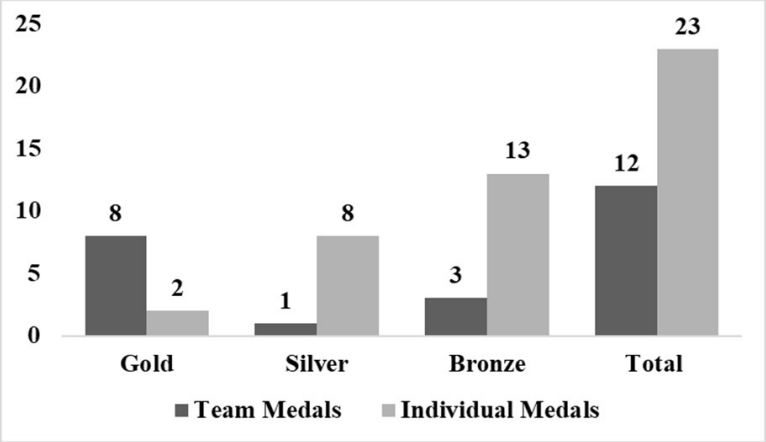


Figure 2.11: Number of Team and Individual Medals won by the Indian Team in Olympic Games

performance of Indian players in the Olympic games (in terms of medals) is performed in comparison with the performance of the top 4 countries in the world including United States, Soviet Union, Germany and Great Britain. The results show that in terms of a number of medals, United States has 46% contribution, Soviet Union has 20% contribution, Germany has 17% contribution, Great Britain has 16% contribution whereas in comparison India has only 1% contribution.

Figure 2.13 shows that there are 23% women medallists in the Olympic games in India. The results show that only P.V. Sindhu has received multiple medals in the Olympic games in India.

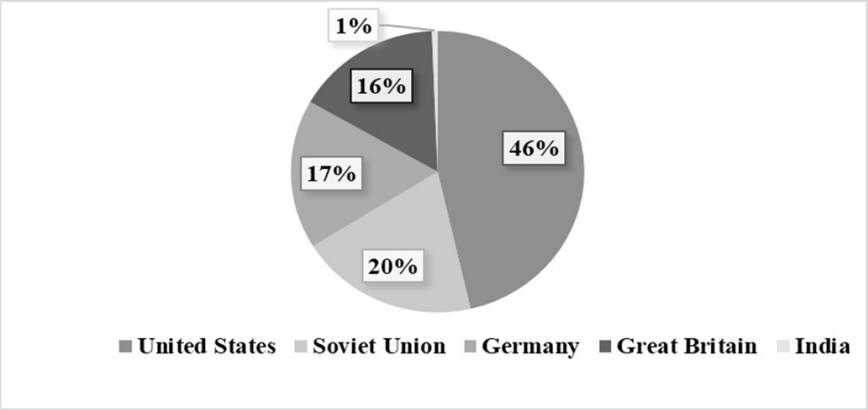


Figure 2.12: Comparison of Performance of Indian players with Top 4 Countries in Olympic Games

2.4 Research Method

The review was carefully planned by developing a review protocol including a search strategy, inclusion criteria, identification of relevant studies and extracting the summary of the studies. Figure 2.14 presents the steps followed in the study selection and evaluation process following the procedure given by Kitchenham et al. (2007). In the first step, the research questions to be answered by this review are formed. In the second step, the search strategy is designed to select the appropriate studies. In the next step, the inclusion and exclusion criteria are formed for each study. The final step involves the data extraction forms and methods for data synthesis.

2.4.1 Formation of Literature Review Questions

The aim of the systematic literature review is to extract the strategies and practices adopted by the nations for winning Olympic games. The Literature Review Questions (LRQ) addressed in this study are listed in table 2.1.

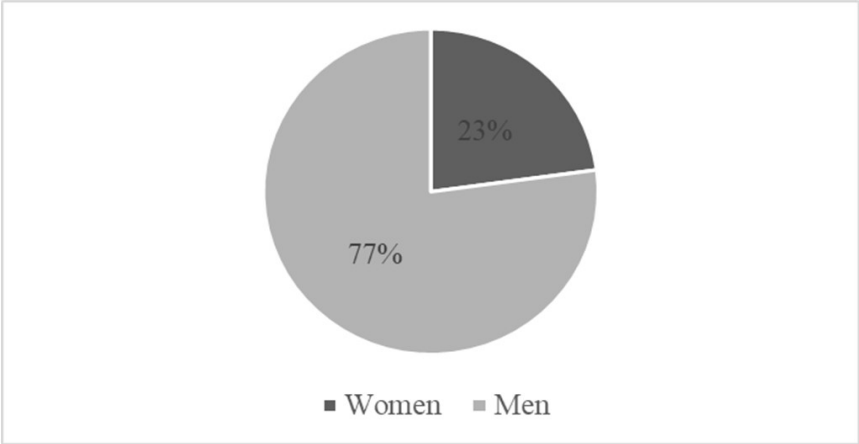


Figure 2.13: Percentage of Indian Women players receiving medals in Olympic Games

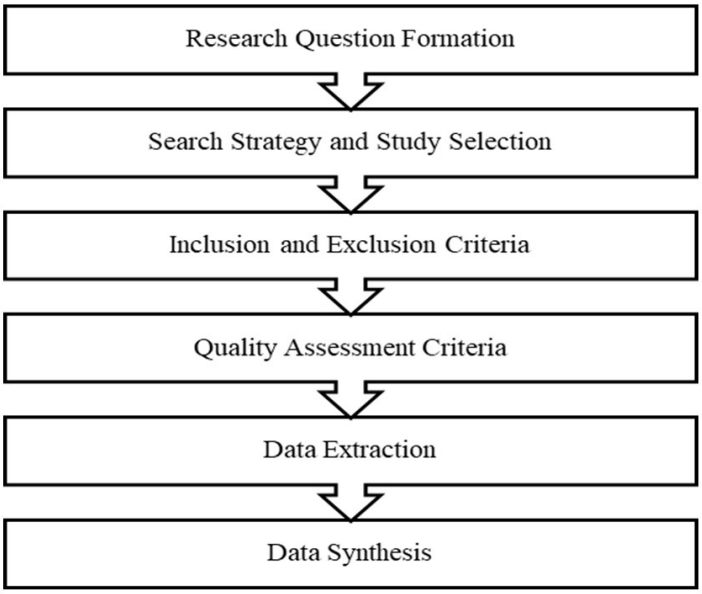


Figure 2.14: Steps Involved in Research Method

2.4.2 Search Strategy and Study Selection

The digital portals were not restricted to the one available at the home university. The electronic databases include IEEE digital portal, ACM digital portal, Science Direct, Springer, Taylor and Francis, SAGE, and Google Scholar. In addition to these digital

Table 2.1: Literature Review Questions

LRQ No.	Literature Review Question
LRQ1	What are the data size, data collection methods and analysis techniques used?
LRQ1.1	How many players participated in the study related to the Olympic games?
LRQ1.2	In which country and year were the Olympic games held in the data collected in the studies?
LRQ1.3	What data collection methods were used?
LRQ1.4	Which data analysis methods were used?
LRQ2	What are the major conclusions including reasons for success in the Olympic Games?
LRQ3	What are the future guidelines for succeeding in Olympics games?
LRQ3.1	What is the impact of economic and financial conditions on the performance in Olympic games?
LRQ3.2	What are the success factors and negative factors influencing the success of an player in the Olympic games?
LRQ4	What are the models and frameworks used by winning nations to improve their performance in the Olympic games?
LRQ5	What are the psychological skills and mental wellness strategies of a successful player?
LRQ6	What are injury management strategies, recovery care and post-Olympic plans of an Olympic player?
LRQ7	What are the recommendations for improving the performance of India in the Olympics?

portals, the publications were searched from the journals in the area to extract the relevant studies. The keywords include ”Olympic”, ”Olympic games” and ”strategy”. The Boolean ”OR” was used to incorporate the alternate and synonym terms and Boolean ”AND” was used to combine the search terms. The studies that analysed the performance of the Olympic players were included in this work. The relevance of these studies was examined and scrutinised by two Professors at Delhi Technological University by examining the abstract, introduction and conclusion of the studies. Regular discussions and meetings were held among these professors to extract the relevant studies. Further, the relevant studies were extracted from the references cited

in these studies.

2.4.3 Inclusion and Exclusion Criteria

The following inclusion criteria was used to extract the studies:

1. Studies providing various strategies, practices or processes to improve performance in the Olympic games.

The exclusion criteria used is as given below:

1. Studies that do not provide any strategy for improving performance in Olympic games.
2. Similar studies published by the same authors whose extension to conference papers in journal publications exist.
3. Review studies

2.4.4 Quality Assessment Criteria

Table 2.2 presents the quality questions used to analyse the relevance and strength of the potential studies. The quality assessment criteria are used for weighting the studies based on the total rank of each question. The questions were weighted as 0 (no), 0.5 (partly) and 1 (yes). A total score was obtained and the studies scoring more than or equal to 50% of the total score were selected in this work. Two independent professors ranked the studies for each quality question. In case of any disagreement other experts and researchers were consulted and a consensus was made. Several brainstorming sessions and thorough discussions were carried out before finalizing the scores of the studies. After an assessment of the quality of the studies, 27 relevant studies were selected in this work. The top two studies include S12 and S17. The study by Ashwani, Dhingra and Kandpal, (2019) did not pass the quality criteria and, hence was not included in the analysis (Ashwani et al., 2019).

Table 2.2: Quality Assessment Questions

Q No.	Question
1	Is the abstract clearly stating the aims of the study?
2	Are the results clearly described?
3	Is the sample size and characteristics specified?
4	Is the data collection procedure stated?
5	Does the study contribute to the Olympic literature?
6	Does the conclusion specify the main results of the work?

2.4.5 Data Extraction and Synthesis

The data extraction forms were used for extracting various dimensions of the study including the country of the study, the focus of the work, major conclusions, factors of a successful player, factors negatively influencing the performance of players and successful models in Olympic games. Two researchers extracted the information in the extraction forms. The purpose of the data synthesis is to combine and present the collected and extracted results of the studies. The data synthesis was carried out by summarizing the qualitative findings of the studies by using tables.

2.5 Results

In this section, the results of the systematic literature review by answering the research questions formed in section 2.3.1 are summarised.

2.5.1 Publication Source

Table 2.3 summarizes the list of publications in top journals of the studies being reviewed in this study. The table lists the impact factor and number of occurrences of studies in the respective journals. The top journals include Sports Medicine, Journal of Sports Sciences, European Sport Management Quarterly, European Journal of Sport Science and so on. There were 8 number of publications published by Taylor and

Francis. Thus, 30% of studies were covered in these journals. All the relevant studies were published in journals. The top five studies with respect to number of citations are S2, S3, S10, S16, S22.

Table 2.3: Summary of Publications in Top Journals

Publication Title	Publisher	Type	Impact Factor	Number
Sports Medicine	Springer	Journal	11.928	01
European Sport Management Quarterly	Taylor and Francis	Journal	3.714	02
Journal of Sports Economics	Sage	Journal	1.848	01
The International Journal of the History of Sport	Taylor and Francis	Journal	0.607	01
Journal of Applied Sport Psychology	Association for Advancement of Applied Sport Psychology	Journal	3.585	01
European Journal of Sport Science	Taylor and Francis	Journal	3.980	01
Sociology of Sport Journal	Human Kinetics	Journal	2.635	02
The Sport Psychologist	Human Kinetics	Journal	1.31	01
Journal of Sports Sciences	Taylor and Francis	Journal	3.943	02
Economic Research-Ekonomska Istraživanja	Taylor and Francis	Journal	3.080	01
Journal of Clinical Sports Psychology	Human Kinetics	Journal	1.98	01
High Ability Studies	Taylor and Francis	Journal	1.563	01

2.5.2 LRQ1: What are the data size, data collection methods and analysis techniques used?

The relevant studies included in this survey along with the unique identifiers are mentioned in table 2.4. These unique identifiers will be used to refer to the relevant studies in all the subsequent sections.

Table 2.4: Selected Studies

Authors	Study No.	Authors	Study No.
Vernacchia et al. (2000)	S1	Güllich (2014)	S15
Greenleaf et al. (2001)	S2	Rees et al. (2016)	S16
Gould et al. (2002)	S3	Zheng and Chen (2016)	S17
Gibbons et al. (2003)	S4	Humphreys et al. (2018)	S18
Kenny et al. (2005)	S5	Laaksonen et al. (2018)	S19
Schinke (2009)	S6	Bennie et al. (2021)	S20
Tan and Green (2008)	S7	Güllich et al. (2019)	S21
Taylor et al. (2008)	S8	Purcell et al. (2019)	S22
Bullock et al. (2009)	S9	Joncheray et al. (2020)	S23
Vaeyens et al. (2009)	S10	Sahin and Senduran (2020)	S24
Werthner and Coleman (2013)	S11	Sun et al. (2020)	S25
Moreau and Nabhan (2012)	S12	Ferguson (2021)	S26
Wicker et al. (2012)	S13	Shasha et al. (2023)	S27
Szabo (2014)	S14		

2.5.2.1 LRQ1.1: How many players participated in the study related to the Olympic games?

Table 2.5 summarizes the details of data collected for analysis by the relevant studies with respect to the study identifier. The table lists the number of participants in a study and stakeholder who have been used for collecting the data such as players, coaches and so on. The players participating in the Olympic games have been used for analyzing all the studies.

2.5.2.2 LRQ1.2: In which country and year were the Olympic games held in the data collected in the studies?

Table 2.6 presents the data description including the country and year in which the Olympic games were carried out, identified summer or winter sessions along with the studies in which they have been used. For example, study S2 used the data collected from the 1996 Atlanta Summer Olympic games.

Table 2.5: Details of Data Collected by Studies

Study Identifier	Data Size
S1	15 Olympic players
S2	8 1996 Summer Olympic players and 7 1998 Winter players
S3	46 US coaches
S4	760 US Olympic players
S6	103 Canadian players (48 females, 55 males)
S8	176 US players
S13	2006 German residents
S15	16 male players
S17	Political leaders, officials, coaches and judges
S18	1540 Canadian residents in pre-Olympic survey and 1660 Canadian residents in post-Olympic survey
S20	20 players
S21	16 players
S23	28 French players
S25	7 male Olympic players
S27	11000 players in 28 sports and 306 events

Table 2.6: Olympic Games Details used for Data Extraction in the Studies

Olympic Year	Olympic Session	Studies
1984-1996 Olympics	-	S1
1996 Atlanta	Summer	S2, S3
1998 Nagano	Winter	S2
1994-1998 Olympics	-	S4
2000 Sydney	Summer	S6, S8
2002 Salt Lake	Winter	S6
2004 Athens	Summer	S6
2006 Torino Winter	Winter	S6, S9
2008 Beijing	Summer	S7
2012 London	Summer	S13, S15
2010 Vancouver	Winter	S18
2018 PyeongChang	Winter	S19
2016 Rio	Summer	S20, S23, S27

2.5.2.3 LRQ1.3: What data collection methods were used?

Table 2.7 summarizes the methods used for collecting the data such as interviews, surveys and questionnaire. The result shows that interviewing was the widely used method for collecting data and was used by 6 studies.

2.5.2.4 LRQ1.4: Which data analysis methods were used?

Table 2.8 lists the methods used for analysing the data.

Table 2.7: Data Collection Method used in the Studies

Data Collection Method	Studies
Interviewing	S1, S2, S17, S20, S23, S25
Survey	S3, S8, S18
Questionnaire	S4, S13, S15
Deliberate programming model	S9

Table 2.8: Data Analysis Methods used in the Studies

Data Analysis Method	Studies
Qualitative analysis	S1, S7, S9, S17, S21, S23, S25
Tabulations	S2, S3, S4, S6
Correlation analysis	S5, S8, S14, S24, S27
Discriminant analysis	S8
Regression analysis	S13
Chi-square	S15
Unpaired t-test, U test	S15
Probit model	S18
Ordinary least squares model	S27

2.5.3 LRQ2: What are the major conclusions including reasons for success in the Olympic Games?

Table 2.9 presents the summary of 27 studies. The studies highlight the framework and techniques for improving the performance of players in the Olympic games which include several factors such as training, mental health, parental support, financial support, level of practice and so on.

Table 2.9: Summary of Studies

Study Identifier	**Country of Study**	**Focus of the work**	**Major conclusions including reasons for success in Olympic Games/Sports**
S1	US	Analyses the psychological characteristics of Olympic players through interviews	The study revealed that enjoyment and having fun while participating in the corresponding sports was key to the success of a player. The development concerns included the relationship with the coach and early participation in a variety of sports. The social factors included family and economic support.

S2	US	Interviews of Olympic players	The study revealed that the important factors that positively influenced the performance of Olympic players include attitude mental skills, physical preparation, multifaceted training, and support services. The factors that negatively affected the performance of Olympic players include normal routine, issues with the coach, media distractions, lack of support, financial issues, family concerns, team unity issues. team selection concerns, overtraining and injury.

S3	US	Survey of the US coaches was conducted	The results revealed that the variables influencing the performance of players one year before the games include the process of team selection, timings of trials and exercises for team building. The variables influencing the performance of the players 90 days before the games include practice/training at the site before game commencement. The other variables that affect the performance of the players were family, weather, media, and team. The three family-related variables include positive family support, spending time with family and getting tickets for the family. Finally, media, crowd support, and Olympic opening ceremonies were among other variables that influenced the performance of players. The factors affecting the coach's performance were fair team selection, team building exercises, training facilities, residency provisions, mental skill training, and team cohesion.

S4	US	US Olympians responded to the Questionnaire	The most influential variables amongst the success factors were reported as the dedication of the player, love of a sport, effective training, family support, excellent coaching (great teacher and commitment to the profession) and financial support. The obstacles were identified as lack of financial support, societal support, Olympic association support, coaching expertise, and so on.
S5	-	Analyzed the performance of Olympic decplayers	The study found a positive correlation between overall performance of Olympic decplayers and maximum excellence in a particular field.

S6	Canada	Analysis of Canadian Summer and Winter Olympic data	It was observed that the players employed adaptation strategies consisting of understanding, controlling, self-enhancement, belongness, trusting. There were several sub-strategies identified. In the category of understand strategy, expectations, environment, opponent and team structure were included. In the controlling category, the sub strategies included were preparedness, distraction control, confidence and assertiveness. In the self-enhancement category, learning and effort were the essential parts. Similarly, belongingness included team, family and community. Finally, trust subcategory included coaches and team members.
S7	China	-	This study analyzed whether China's policy for elite development system was effective as compared to other western countries. It was concluded that there is lots of similarity between China's model for sports and the countries such as Germany, Canada, Australia, UK, with their own domestic variations.

S8	US	Survey of US Olympic players	The results show that there is a significant difference between the practice and competition performance of medallists and non medallists. It was shown that the medallists applied more psychological skills in both practice and competition as compared to non medallists. With regard to competition strategies, the Olympic medallists scored highest in emotional control and imagery. With respect to practice strategies, the Olympic medallists scored highest in attentional control and goal setting. Hence, the study concluded that emotional control, self-talk and imagery were the keys to the performance of Olympic players.
S9	Australia	Preparation of female players for the Olympic game	In this work, an intensified training programme was provided to a player for reaching the Olympics following the concept of deliberate programming. Deliberate programming involved training with the best types of equipment, sport science support, the best coaches, exposure to competitions, and no financial stress.

S10	-	Olympic sports data was analysed	It was observed that world-class players underwent talent promotion programs at a significantly later age. It was found that the training programmes and discipline-specific training volumes during adolescence were not related to greater success in senior elite sports.
S11	Canada	Sports Psychology consultants	The work provides guidelines to the Olympic players regarding the concepts of values and ethics with respect to the Olympic games. The sports psychology consultants prepare the player to be mentally tough with a positive attitude. The psychological skills will help the players to focus on the important factors related to training and have a better understanding of their emotions to achieve high quality performance in competition.

S12	US	Model of United States Olympic Committee is described	The study describes the model of sports performance and medicine utilized by the training centers of the United States Olympic Committee (USOC). The USOC consists of three training centres including National Governing Bodies (NGB) high performance centers and specialty centers. The NGBs are categorized by respective ”sportfolios” such as individual sports, and team sports. Each sportfolios include a performance specialist belonging to the discipline of the sportfolios. Further, each sportfolios consist of exercise physiologist, sports nutritionist, sports psychologist and biomechanical analytics. The purpose of sports medicine division of USOC is to provide clinical services to the Olympic training centers and to develop a country-wide network of medical providers that will support the Olympic players. Each of the three training centers has a manager and multiple clinicians from different backgrounds.

S13	Germany	Survey of the resident population in Germany for Willingness to Pay for Olympic sports	The study summarized the following aspects: 1) Consumption capital was found to be the prime driver in increasing the value of success in the Olympic games. 2) The success in Olympic medals may improve the sport participation of the resident population and can result in health improvement. 3) The current success of players in the Olympics and the fairness of players had a positive influence on the residents in terms of willingness to pay for Olympic sports.
S14	-	Correlation analysis between research output and Olympic medals won	The results show that US, UK and Canada have most of the publications. There was a correlation found between research output and a number of Olympic medals received by the country. Finally, there was a strong correlation between research output in Sport and Exercise Psychology and success in the Olympic Games measured in terms of the numbers of medals won.

S15	-	-	The study analyzed the 2012 Olympic champions in men's hockey. The winning players had longer periods of continuous training/ practice sessions in early childhood and had greater involvement in other sports.
S16	UK	Review of existing studies	The review makes recommendations for the development of the world's best talent in sports: 1) The Performer: Genetic profiling can be used in helping players to make informed and well-versed decisions in their initial development years regarding the appropriateness of a particular sports type. Appropriate procedures can be followed for making use of anthropometric and physiological tests for selecting talent in sports. 2) The Environment: It was suggested that the birth place may be considered while designing search initiatives for talent. Parental and coach support plays an important role in the development of elite players. 3) Practice and Training: Deliberate practice must be promoted and the benefits of enjoyment in practice can be acknowledged.

S17	China	Elite sport system of China has been studied	The elite sport system of China is based on two approaches: 1) Cluster-based approach by Tian (1988): It focuses on the formation of strategic, similarity and skill-based clusters and subclusters. Innovative training and coaching techniques & theories were used within the clusters. The sustainable structures were developed by the widening of clusters of sports, working collectively through collective training and research programs. China took advantage of training sports personnel in lagging female sports having a lower degree of international competition. 2) China worked on ”five-word principle”, namely ’Small, Fast, Women, Water and Agile’. Small refers to small balls and similar categories. Fast signifies the sports that have speed requirements. Women refer to the sports in which female player participates. Water relates to sports including water such as diving. Agile emphasizes the tactical aspects of the sport.

S18	Canada	Willingness to pay for Olympic medals	This study analyses the willingness to pay of Canadian residents for the government programme to increase the Olympic medals. The results were computed after conducting a survey and revealed that most of the surveyed residents were proud if the Olympians won the medals in the Olympic games. The willingness to pay tax for the funding of Olympic players increased after the Olympic games.
S19	Sweden	Analysis of biathlon coaches	The study analyses biathlon, a sport with a combination of cross-country skiing and rifle shooting. It was observed that starting from low-intensity training with an increase in medium and high-intensive training as the season progressed was effective.

S20	Australia	Australian players were interviewed to share their post-Olympic Games experiences	The study focuses on guiding the sports organization, coaches and family in helping a player to come back to normality immediately after the Olympic games. The authors observed that in the post-Olympic phase, the organizational restructure, changes in coaches and cuts in funding were the prime factors that affected the player's wellbeing. It was observed that making post-Olympic plans and providing sport psychology services well in advance helped recover from the mental stress of the Olympic games.
S21	Great Britain	Analyses of biographies of Olympic players and interviewing coaches and parents	The findings yield that several factors contribute to the development of an international player. The factors include family values, exhaustive training, positive sport-related events in the early phases of life, pushing oneself beyond the limits, coach-led extensive practice, years of experience in international sports and so on.

S22	Australia	Framework for dealing with players' mental health and wellbeing	In this work, the mental health and wellbeing of elite players were examined. The assessment suggested that early detection of mental health issues is important. The study focuses on training the player to manage psychological issues using self-management techniques, training the coaches.
S23	France	28 French players were interviewed	The analysis conducted in the study revealed that training and physical preparation were the two main drivers of increased performance of an Olympic player. The study concluded that mental preparation, nutrition and recovery care were not given the same importance as training and physical preparation.
S24	-	Content analysis of 1027 articles was conducted	It was seen that the developed countries with the highest GDP were successful in the Olympics and the majority of the studies were conducted by authors from the US, UK and Australia. One of the findings was that quality research and publications in sports science have a positive impact on success in the Olympics.

S25	US	Semi-structured interviews of players were carried out	The study revealed that at the elite level of sports injury was the potential barrier reported by the players in their performance. However, the players were still able to maintain their long-term goals. Thus, prevention and planning of injuries must be one of the prime concerns.
S26	Australia	Personal experience at Australian Sports Commission	Based on the extensive study of 15 countries, the study concluded that nine pillars contribute to an effective sports organization namely, financial support, management, governance, training facilities, coaching, talent identification and development, sports sciences and competition.
S27	-	Regression analysis is performed	The study revealed that inflation and income rate were affecting the performance in terms of medal rankings by a country in the Olympic games.

2.5.4 LRQ3: What are the future guidelines for succeeding in Olympics games?

There is a huge difference between the performance of a player across countries. The 2020 Olympic games medal table show that 24.7% countries won 64% medals. This gap in the performance among countries is due to the difference in economic conditions, resource availability and support systems across the countries. This section provides a summary of factors derived from the relevant studies (S1-S27) that can improve the performance of a player in the Olympic games.

2.5.4.1 LRQ3.1 What is the impact of economic and financial conditions on the performance in the Olympic games?

The investment of a nation in sports gives a positive impact on the success of a sport. However, it is difficult for a developing country to achieve this and divert the financial resources to sports development and activities. In S24, it was observed that the developed countries with higher GDP showed more consistency and success in the Olympic games. The high-income countries such as the US, United Kingdom, Italy, Germany are higher in medal tally in the Olympic games (S27). In study S27, a statistical analysis was carried out and it was found that the country's income classification and the active population were found to be related to the medal tally in the Olympic games. Countries with large populations have a higher chance of succeeding in international tournaments as compared to countries with fewer populations (S24). The developing countries with a large population can also focus the constrained resources on the talented pool of players as these countries have genetically gifted players with better attributes such as height, weight, and muscular strength.

2.5.4.2 LRQ3.2 What are the success factors and negative factors influencing the success of a player in the Olympic games?

In the studies (S1-S27) reviewed in this work, a variety of success factors and attributes of a player were identified and defined that can lead to the success of a player in the Olympic games. In order to achieve the same, the factors and subfactors are summarized in table 2.10. We have categorized the subfactors from the relevant studies and grouped them under the corresponding most relevant contributing factor. These factors will help provide guidelines to the countries for improving their performance in the Olympic games. Table 2.11 lists the factors negatively contributing to the success

Table 2.10: Factors and Subfactors of a Successful Player in Olympic Games

Factors	**Subfactors**	**Supporting Studies**
Physical preparedness	Effective Training	S3, S4, S6, S9, S10, S15, S16, S21, S23
	Involvement in other sports	S15
	Olympic Simulation	S2
Attitude	Enjoyment and fun	S1, S16
	Values and ethics	S11
Support	Family support	S1, S2, S3, S4, S16, S21
	Financial/economical support	S1, S3, S4, S9, S25, S26
	Social support	S2, S4, S25
Coach-player relationship	Friendliness	S2
	Trust	S2, S6
	Feedback	S2
	Availability	S2
	Good plan	S2
	Excellent coaching	S4, S16, S21, S26
Mental health and wellness	Emotional control	S8, S11
	Self-management	S22
Mental skills	Psychological training	S2, S3, S25
	Confidence	S2, S6
	Relaxation strategies	S2
	Mental Imaginary/visualisation	S1
	Patience	S1
	Blocking distractions	S2, S3, S6
Health	Nutrition	S23

of an player in the Olympic games.

Table 2.11: Factors Negatively Influencing Players in Olympic Games

Factors	Supporting Studies
Conflicts with coaches	S2
Media distractions	S2, S3
Lack of social support	S4
Team selection concerns	S2
Overtraining	S2
Stress	S2
Financial issues	S2, S4
Family concerns	S2
Team cohesiveness	S2, S3, S6
Injury	S2, S4, S22, S25
Unavailability of psychological counsellor	S2

2.5.5 LRQ4: What are the models and frameworks used by winning nations to improve their performance in the Olympic games?

There are several central federations and agencies that govern sports in the majority of countries. As can be seen in section 2, the top medallist in the Olympic games tally is from the US. The US model consists of USOC which has three Olympic Training Centers (OTC) (S12). The NGB selects players that are trained in OTC. There are two divisions in the USOC namely sports performance and medicine divisions with effective communication with each other. The USOC is headed by CEO and governing body. The USOC sports performance division is headed by the chief of sports who in turn reports to the CEO. The chief of sports further employs the team leaders to coordinate between USOC and NGBs. The NGBs are categorised into various ”sportfolios” according to different sports. Each sportfolios has a performance specialist with regard to each sport type. Each sportfolio has physiology, strength and conditioning, sports psychologist, sports nutritionist, and biomechanical analytics

(S12).

The USOC sports medicine division is headed by a managing director and its function is to work with the OTCs for medical services. Each OTC has multiple medical specialists and is led by a manager. The responsibility of the sports medicine division is to supervise the training sessions, provide medical advice, monitor the mental wellness of a player, conduct medical examinations, provide nutrition advice, prevention and treatment of injuries.

Hence, the people with whom a player communicates include sports bodies, coaches, sports nutritionists, psychologists, family, sports medicine consultants and staff, strength and conditioning, media and so on (S12).

2.5.6 LRQ5: What are the psychological skills and mental wellness strategies of a successful player?

Various studies (S2, S8, S11, S14, S22, S25) have emphasized that psychological training is essential for coping with stress and enhancing mental performance. Many studies also emphasized that working with a sports psychology consultant was required. Study S8 concluded that the psychological skills and strategies were more employed by medallists as compared to non medallists. Therefore, formal training and practice devoted to the usage of psychological skills are essential for players. Further, emotional control, imagery and self-talk were found to be significant components of a successful player (S8).

In study S22, the mental health framework is divided into two parts early intervention for existing or emerging mental health conditions and recovery. The first portion requires prevention or early identification and the second portion requires treatment and continuous care of a player. For preventive mental health care, several preventive measures can be taken such as the conduct of educative programmes on mental health care, the development of an player and screening of mental health (S22). Mental

health educative programmes can be given to the coach, players, supporting staff and family. The programme may include knowledge of the risk factors that can affect mental health, identification of symptoms of adverse mental health, self-management and relaxation strategies and from whom to seek help.

The individual development programme may focus on the management of the balance of life-sport and prepare and plan for the end of the sports phase. These programmes can be conducted by individuals who can share their life experiences and have been through mental health issues. The training team may also include former coaches and players (S22). The mental health screening can be carried out in routine and at critical times such as injury or when the player is out of sports. One of the examples of the early mental health identification model is the Australian Institute of Sport mental health referral network (S22).

2.5.7 LRQ6: What are injury management strategies, recovery care and post-Olympic plans of an Olympic player?

The Olympic player must be able to compete in order to deliver their highest performance. However, long and intensive training sessions can result in injuries. In study S25, it was observed that injury is the primary barrier to the performance of an Olympic player. The coaches and staff should pay attention to the training routines that might lead to injury (S2, S25). Further, injury causes stress in the players and thus the goals must be carefully planned and strategized.

The periodization training along with adequate rest can help in the prevention of an injury (S25). Therefore, the coaches and players must carefully plan the training sessions so that the performance can be maximised and the injuries can be minimised. The period for restoration and regeneration both physiologically and psychologically is essential for a player (Vaile et al., 2008). Recovery care is sometimes considered an optional factor and often not implemented by the coaches and players (S23).

An player needs to come back to normality after the Olympic games. Hence, keeping this in view, study S20 emphasizes the ways and means using which players can maintain their wellbeing during the post-Olympic period. Immediately after the competition, celebrations with a family, informal meeting with the coach, and supporting teammates was found to positively influence the mental wellbeing of a player. Further, connecting with friends, informal meetings and follow-up calls after the Olympic games are over also helped the players in maintaining their wellbeing. Strained relationships with coaches, uncertainty about funding specifically in the case of the female player in less funded sports, and unavailability of psychologists have a negative effect on wellbeing of players during the post-Olympic period. The study (S20) concluded that strong support from coaches, family, friends and psychologists is essential for post-Olympic wellbeing.

2.5.8 LRQ7: What are the recommendations for improving the performance of India in the Olympics?

As can be seen from section 2.2, although the performance of India has improved since the first Olympics there is still a lot of potential and scope for improvement of India in the Olympic games in terms of the medal tally. There is very less participation of women players in the Olympic games. Thus, female participation should be enhanced in the Indian Olympic games.

Indian sports are managed by the SAI which has various regional and training centers. This chapter provides a summary of practices and strategies that made a player successful in the Olympic games from various countries. These can be taken as guidelines and will help in refining the existing sports management system of India and other developing countries.

Given the high population of India, a large number of players must be trained so that participation in the Olympic games can be increased significantly. More educational

training programmes must be conducted to explain the importance of sports and motivate young individuals to participate in sports.

The government should also further enhance the spending on the schemes and policies for supporting sports players. The infrastructure and facilities must be created and improved in various regions of the country with a proper team of training personnel (coach, physiotherapist, nutritionist, sports psychologist, yoga instructor) and quality equipment. A framework and model consisting of various key elements should be developed keeping in view the models of the world's best countries in terms of performance in the Olympics.

2.6 Future Directions and Research Gaps

Future studies may be conducted to exhibit the relationship between coach and player. Studies capturing the perceptions of parents on emotional, financial, and social support are required. Studies on the importance of physical training while not overtraining are required (S2). Studies on the perceptions of players on education, training, lack of resources in the current scenario and nutritional management in the Indian context can help in improving the framework of sports management and increase the medal tally. Further carrying out studies from different cultural backgrounds will provide insight into parental support and involvement in the success of an player.

Quantitative data may be obtained from various countries to analyse and improve the performance of Olympic players. Studies providing suggestions on the policy reforms for developing countries will further help in improving the medal tally.

It would be interesting to evaluate the factors of Olympic success by analysing the players just before the game, during the game and after the game (S13). In future research, it would be interesting to observe how psychological skills at the junior level influence performance at the elite adult level. A study on how the world's leading performers maintain emotional control, focus and concentration? How these skills

can be taught to the players? (S16).

In future research, the reactions of Olympic players in their post-Olympic phase may be recorded. Also, the interviews of coaches, psychologists and parents must be taken to get deeper insights into the post-Olympic phase of the players (S20).

The studies based on issues faced by players at different ages in their careers will provide insights to the coaches, parents and sports organizations to design age-appropriate training and talent development (S25).

2.7 Summary of Results

In this chapter, a survey of 27 relevant studies is performed in order to extract the mechanisms and strategies for improving the performance of players in the Olympic games. The study analyses the current perspective of Olympic games in terms of participation of countries and players, events, sports, participation of women players and ranking of the top 10 countries in terms of medals received in summer and winter Olympics. We summarize the current position of Indian players in the Olympic games. Further, based on the survey performed, the future guidelines conducting studies are given in Indian context.

The major results of the survey and analysis are summarised below:

1. United States, Soviet Union, Germany, Great Britain, and France are the top five countries in the Olympic medal tally in the summer games. Norway, United States, Germany, Soviet Union, and Canada are the top five countries in the Olympic medal tally in the winter games. There is growth in women Olympic players from 1984 to 2020 in both the summer and winter Olympic games.

2. India has won 10 gold, 9 silver and 16 bronze medals in the Olympic games. There is a 1% of contribution in comparision to the top 5 countries in the world in terms of the number of Olympic medals. There are only 23% of women

players in India in the Olympic games.

3. The results show that the majority of the studies used interviewing method for data collection and qualitative analysis, tabulations and correlation analysis were used for analysing the data.

4. The study summarizes the key factors and subfactors of a successful Olympic player such as physical preparedness, motivation, daily routine, practice, attitude, support (emotional, financial, society), Coach-player relationship, mental skills, Mental health, wellness and health. The negative factors influencing the success of a player include conflicts with coaches, media distractions, lack of social support, overtraining, stress, financial concerns and so on.

5. For delivering the highest performance it is recommended that the coaches pay attention to the training routines that might lead to injuries and should focus on strengthening and conditioning along with the preparation of relaxation sessions for the players. Similarly, the recovery care of a player must be optimally taken.

6. More studies must be conducted in the Indian context and the perception of coaches, parents and players must be captured. Keeping in view the models of the world's best countries in terms of performance in the Olympics and the results of this work, a framework for effective management of sports consisting of various key elements will be suggested. The government should also further enhance the spending on the schemes and policies for supporting sports players.

The infrastructure and facilities must be created and improved in various regions of the country with a proper team of training personnel (coach, physiotherapist, nutritionist, sports psychologist, yoga instructor) and quality equipment. Given the high population of India, a large number of players must be trained so that participation in the Olympic games can be increased significantly. More number of educational training programmes must be conducted to explain the importance of sports and motivate young individuals to participate in sports.

Chapter 3

Research Methodology

A mixed research method is followed for this study. Mixed research method is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, and inference techniques) for the comprehensive purposes of breadth and depth of understanding and substantiation. This chapter presents the research process followed in this thesis and the steps used in questionnaire development. The chapter is organized as follows: Section 3.1 describes the research process followed in the subsequent chapters. Section 3.2 presents ten steps in the questionnaire development. Section 3.3 describes the process of mediation analysis and section 3.4 summarises the experiment design methods.

3.1 Research Process

Figure 3.1 presents the research process used in the subsequent chapters. The following subsections describe the steps of the research process.

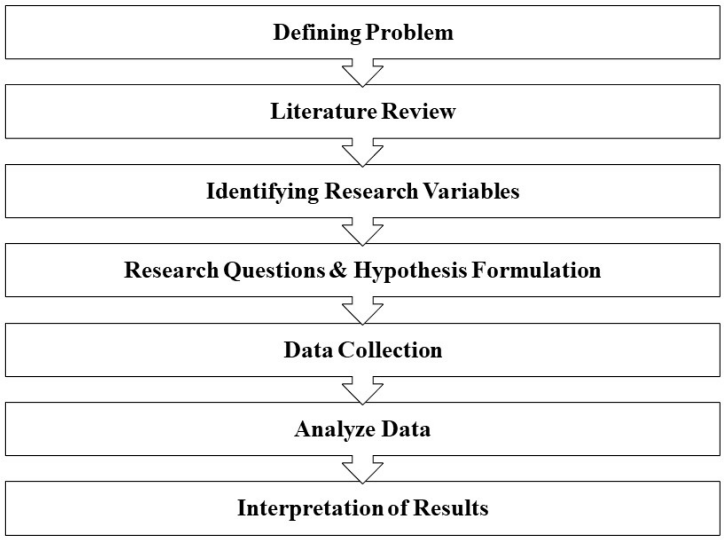


Figure 3.1: Research Process Steps

3.1.1 Defining Problem

The first step is to identify the research problem. In this step, the research questions are identified and the main relationships that need to be explored are defined.

3.1.2 Literature Review

In this step, the existing literature is reviewed to explore the current literature on the topic. There have been few studies that analyse the coach, parent and player responses.

3.1.3 Identifying Research Variables

In order to assess the questionnaire, it is important to define the independent, dependent and mediating variables. The questionnaire is developed based on the constructs/variables to capture the coach, parent and player perspectives. Independent variables are varied and the effect of these variables is found on the dependent variable. Independent variables are the constructs based on the coach's skill set, parental involvement and player orientation. Sports management is the dependent variable. The

mediating variable mediates and explains the relationship between independent and dependent variables. Player Preparation is the mediating variable in this study. Figure 3.2 shows the relationship between independent, dependent and mediating variables.

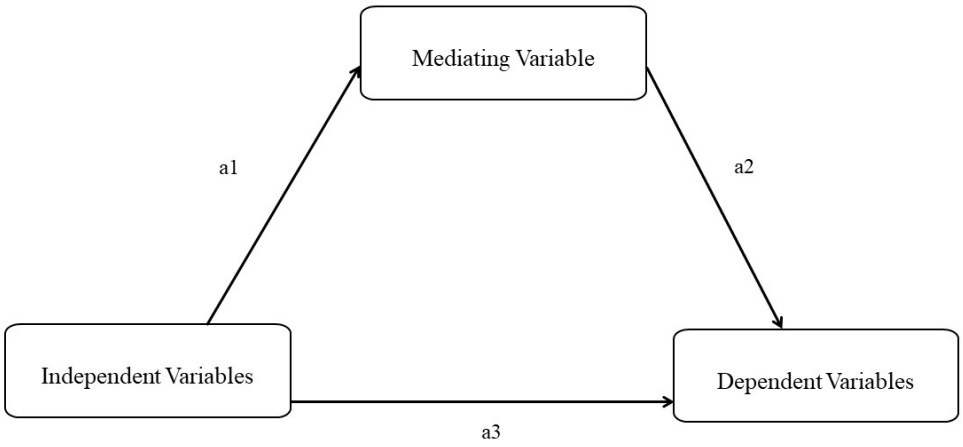


Figure 3.2: Model with Mediating Variable

3.1.4 Research Questions and Hypothesis Formulation

After the literature review, the research questions must be formed and hypotheses of the work must be developed. The hypothesis is the assumption of the research. Based on the obtained results the hypothesis is accepted or rejected. This section presents the research questions and hypotheses to be tested in this work, corresponding to each objective defined in section 1.4.

3.1.4.1 Objective 1: To identify the physical attributes, flat feet & knock knees in primary school children

The research questions for objective 1 are given below:

- RQ_{1a}: What is the prevalence of flat feet and knock knees amongst primary

school children?

- RQ_{1b}: What is the effect of age, gender, and weight on the prevalence of flat feet and knock knees amongst primary school children?

- RQ_{1c}: What is the relationship between flat feet and knock knees with respect to primary school children?

- RQ_{1d}: What is the effect of flat feet and knock knees in sports activities and what suggestive measures for preventing flat feet and knock knees amongst children?

The hypotheses formulated with respect to Objective 1 are given below:

- H_{1a}: The prevalence of flat feet amongst primary school children is likely to decrease with age (Null Hypothesis: The prevalence of flat feet amongst primary school children is likely to increase with age).

- H_{1b}: The prevalence of flat feet amongst primary school children is likely to be more in males as compared to females (Null Hypothesis: The prevalence of flat feet amongst primary school children is likely to be less in males as compared to females).

- H_{1c}: The prevalence of flat feet amongst primary school children is likely to increase with higher weight (Null Hypothesis: The prevalence of flat feet amongst primary school children is likely to decrease with higher weight).

- H_{2a}: The prevalence of knock knees amongst primary school children is likely to decrease with age (Null Hypothesis: The prevalence of knock knees amongst primary school children is likely to increase with age).

- H_{2b}: The prevalence of knock knees amongst primary school children is likely to be more in males as compared to females (Null Hypothesis: The prevalence

of knock knees amongst primary school children is likely to be less in males as compared to females).

- H_{2c}: The prevalence of knock knees amongst primary school children is likely to increase with higher weight (Null Hypothesis: The prevalence of knock knees amongst primary school children is likely to decrease with higher weight).

- H_3: The prevalence of flat feet is likely to be more in primary school children with knock knees (Null Hypothesis: The prevalence of flat feet is likely to be less in primary school children with knock knees).

3.1.4.2 Objective 2: To identify the influence of the coach skill set inventory on sports management

The research questions for objective 2 are given below:

- RQ_{2a}: What is the coach's perspective on the education and experience of coaches?

- RQ_{2b}: What is the effect of training attributes such as agility, flexibility, endurance and strength on sports management?

- RQ_{2c}: What is the importance of agility, flexibility, endurance and strength for appropriate player preparation from the coach's perspective?

- RQ_{2d}: Is specialist supervision required for agility, flexibility, endurance and strength training for player preparation from the coach's perspective and who is responsible for the preparation of nutrition plans for the players?

- RQ_{2e}: Whether the coach is overloaded with too much time spent with players?

- RQ_{2f}: What are the training requirements for player preparations from the coach's perspective?

The hypotheses formulated with respect to Objective 2 are given below:

- H_{4a}: Coach education is positively related to sports management
- H_{4b}: Coach experience is positively related to sports management
- H_{4c}: Agility is positively related to sports management
- H_{4d}: Flexibility is positively related to sports management
- H_{4e}: Endurance is positively related to sports management
- H_{4f}: Strengthening is positively related to sports management

3.1.4.3 Objective 3: To identify the parental involvement towards sports management with player preparation as a mediating variable

The research questions for objective 3 are given below:

- RQ_{3a}: What is the effect of emotional, financial and social support on sports management with the mediation effect of player preparation from the parent's perspective?
- RQ_{3b}: What are the current responsibilities of the coach and in what area separate trainer is required from the parent's perspective?
- RQ_{3c}: What is the satisfaction level of the player's parents with the government schemes?
- RQ_{3d}: From the parent's perspective is there any financial support provided to the players?
- RQ_{3e}: What are the suggestions of parents for improving training facilities and national financial schemes?

The hypotheses formulated with respect to Objective 3 are given below:

- H_{5a}: Emotional support has a positive influence on player preparation
- H_{5b}: Financial support has a positive influence on player preparation
- H_{5c}: Social support has a positive influence on player preparation
- H_{5d}: Emotional support has a positive influence on sports management
- H_{5e}: Financial support has a positive influence on sports management
- H_{5f}: Social support has a positive influence on sports management
- H_{5g}: Player preparation has a mediation effect between emotional support and sports management
- H_{5h}: Player preparation has a mediation effect between financial support and sports management
- H_{5i}: Player preparation has a mediation effect between social support and sports management

3.1.4.4 Objective 4: To identify the player orientation towards sports management with player preparation as a mediating variable

The research questions for objective 4 are given below:

- RQ_{4a}: What is the impact of daily routine, education, motivation and practice & exercise on sports management with the mediation effect of player preparation from the player's perspective?
- RQ_{4b}: What are the problems faced by players after the training sessions and what are their likes and dislikes about coaches?
- RQ_{4c}: What are the responsibilities of the coach (agility, endurance, flexibility, strengthening, nutrition plans, relaxation sessions) and in which area separate trainers are required according to the player's perspective?

- RQ_{4d}: Who is the main factor of support in an athletic career from the player's perspective?
- RQ_{4e}: What is the satisfaction level of the players with the government schemes?
- RQ_{4f}: What are the post-athletic plans and future plans after sports of players?

The hypotheses formulated with respect to Objective 4 are given below:

- H_{6a}: Daily routine has a positive influence on player preparation
- H_{6b}: Education has a positive influence on player preparation
- H_{6c}: Level of motivation has a positive influence on player preparation
- H_{6d}: Level of practice and exercise has a positive influence on player preparation
- H_{6e}: Daily routine has a positive influence on sports management
- H_{6f}: Education has a positive influence on sports management
- H_{6g}: Level of motivation has a positive influence on sports management
- H_{6h}: Level of practice and exercise has a positive influence on sports management.
- H_{6i}: Player preparation has a mediation effect between daily routine and sports management
- H_{6j}: Player preparation has a mediation effect between education and sports management
- H_{6k}: Player preparation has a mediation effect between level of motivation and sports management
- H_{6l}: Player preparation has a mediation effect between level of practice & exercise and sports management

3.1.4.5 Objective 5: To develop a conceptual framework for sports management

The research question for objective 5 is given below:

- RQ_5: What are the recommendations for improving the performance of India in Badminton Sports?

3.1.5 Data Collection

Based on the understanding developed till this stage, the standardized questionnaire shall be developed and used for data collection is planned to be consisting of the following sections (This may be further refined as more insights are gained): A) Key factors affecting the physical fitness of prospective players, B) Skill set Inventory for coaches, C) Parental orientation towards sports as a career, D) Player orientation towards sports management E) Player preparation F) Sports management.

The study carried out in Chapter 4 collects data from two schools in Delhi, India consisting of 1590 participants with 888 male children and 702 female children aged between 6 to 10 years. The children are assessed for the prevalence of flat feet and knock knees by a team of experts. The screening and assessment at an early age amongst school children will not only provide information to parents but also will prevent the issue from being converted into a serious concern. Further, this information can be effectively utilized by parents in deciding on appropriate sports as a child's career.

In Chapters 5-7, the responses are collected through a questionnaire. Chapter 5 collects data from 82 coaches in badminton sports on the importance of physical education, agility, flexibility, endurance and strengthening in player preparation. The data is collected from 314 parents whose children are participating in badminton sports across various states of India in Chapter 6 focusing on the emotional, financial and social support provided to players. In Chapter 7, we survey 754 Badminton players with the aim to gather their views on the influence of motivational factors, education,

daily routine and practice level on player preparation and sports management. The questionnaire is carefully designed and validated using the steps given in section 3.2.

3.1.6 Analyzing Data

An appropriate data analysis method is selected based on the nature and size of the data. In this work, the PLS-SEM approach is used to develop and validate the measurement and structural model, evaluate the conceptual framework presented in section 1.5 and perform mediation analysis. The methods used are summarised in the subsequent sections.

3.1.6.1 Chi-square Test

The Chi-square test, a non-parametric test, is applied to find the existence of a significant difference amongst expected and observed frequency (Weaver et al., 2017). The test works on categorical data that is either ordinal or ordinal. The test has been applied at a level of significance of 0.01 level. In this work, we use the chi-square test to find an association between age and gender with flat feet and knock knees. The association between flat feet and knock knees is also analysed.

3.1.6.2 Univariate Logistic Regression

Logistic Regression, a statistical technique, predicts the value of dependent variables based on the set of independent variables. In logistic regression, the dependent variable should have categorical or dichotomous values and there should not be any dependency between independent variables or in other terms we can say that the independent variable should not have multicollinearity (Hosmer and Lemeshow, 1989). Logistic Regression makes use of the sigmoid function to convert the results of linear regression (probabilities) into logistic regression results (categories either 0 or 1). A complete description of logistic regression is given in (Belsley et al., 1980;

Hosmer and Lemeshow, 1989). In this work, univariate analysis is carried out in which the individual effect of the independent variables is found on the dependent variable. The logistic regression method is used in Chapter 4.

3.1.6.3 Linear Regression

It is one of the most widely used mathematical approaches which is used to perform predictive analysis (Maulud and Abdulazeez, 2020). It is a statistical approach used for modelling the relationship between a dependent variable and one or more independent variables by fitting a linear equation to observed data points (James et al., 2013). The goal is to find the line of best fit that minimizes the difference between predicted values and observed values. Linear regression can be of two types: simple linear regression and multivariate linear regression. The simple or univariate linear regression approach generates the output based on a single independent variable and the multivariate linear regression approach generates the output based on multiple independent variables (Natarajan et al., 2023). In this work, we use univariate linear regression to find the individual effect of each attribute of coach's skill set on sports management. This method is used in Chapter 5.

3.1.6.4 Partial Least Square-Structural Equation Modeling

The direct and indirect effect is analysed between constructs and mediation analysis is done through the PLS-SEM approach. SEM analysis involves the development of a model depicting how the constructs are theoretically related to each other (Bagozzi and Yi, 1988). The PLS-SEM analysis (Cepeda-Carrion et al., 2018; Chin et al., 2003; Leguina, 2015; Wong, 2013) is used for the development and validation of the proposed path model. This approach is used in chapters 6 and 7.

3.1.7 Interpretation of Results

Based on the results of the hypothesis validation and responses of the questionnaire, the theoretical and practical significance of the work is evaluated and the results are discussed.

3.2 Questionnaire Development

A questionnaire is designed for validating the relationships established in this study. The questionnaire is used to gather the perceptions of coaches, parents and players in chapters 5, 6, and 7, respectively. The questionnaire is broadly divided into two sections. The first section (Section A) collects the demographics of the coaches, parents and players such as age, gender, qualification, and experience. The second section (Section B) focuses on the questions related to various constructs. The questionnaires developed in this work and the process of their development are presented in the respective chapters.

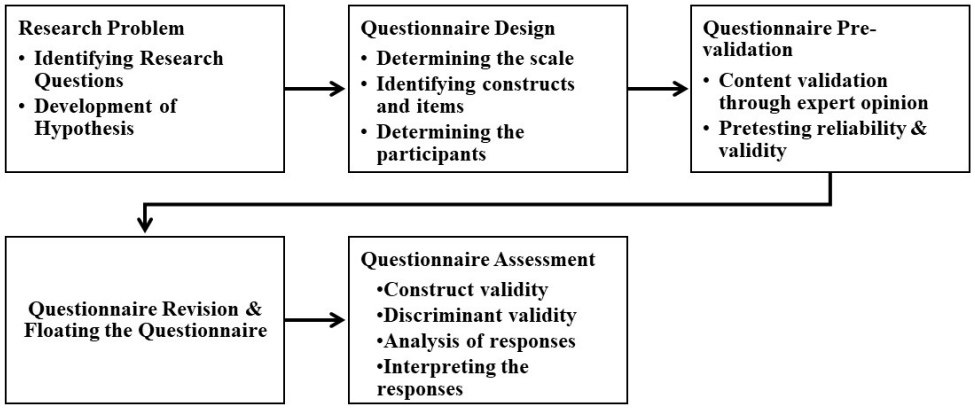


Figure 3.3: Steps in Questionnaire Development

3.2.1 Questionnaire Design

The questionnaire consists of a five-point scale point (1-Strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree) for measuring the responses of the coaches, parents and players. Three questionnaires are designed with the following participants across various states in India:

- Coaches: The coaches with the Badminton academies to find their perspective on factors required as an essential skill set for badminton sports coaches.
- Parents: The parents of the Badminton players to find their perspective on emotional and financial support, the requirement of specialists trainers and government support.
- Players: Badminton players who atleast participated at the zonal level to find their perspective on sports management, problems faced during training sessions, the requirement of specialist trainers and post-athletic plans.

The questions on constructs such as education, experience, flexibility, agility, endurance, strengthening and sports management were formed with respect to coaches. The attributes were used to capture the emotional, financial and social aspects of the player from the parent's perspective. Similarly, questions on the constructs namely daily routine, education, level of motivation, level of practice and sports management were formed to gather the player's perspective. Table 3.1 presents the independent variables used in the study. In the case of physical attributes, flat feet and knock knees are dependent variables. Sports management is the dependent variable and player preparation is the mediating variable for rest of the variables.

3.2.2 Questionnaire Pre-validation

Content validity can be defined as the degree to which the constructs are valid and map with the indicators (DeVellis and Thorpe, 2021). A careful analysis was carried out by

Table 3.1: Independent Variables Identified in this Study

Variable	Constructs
Physical Attributes	Age Gender Weight
Coach Skill Set	Education Experience Agility Flexibility Endurance Strengthening
Parental Involvement	Emotional Support Financial Support Social Support
Player Orientation	Daily Routine Education Level of Motivation Level of Practice and Exercise

a team of experts for checking the relevancy and representation of the constructs of the questions. All the questions marked as essential and relevant by the experts were retained in the questionnaire. The Cronbach alpha test was used to examine the initial reliability of the questionnaire with few samples.

3.2.3 Questionnaire Revision and Release

The questionnaire was shared with two renowned players and their parents, one national and one international coach electronically for content validation, feedback and suggestions. Further, the questionnaire was validated by two professors in similar domain. All the suggestions proposed were well incorporated into the questionnaire. A Google form through email has been canvassed to the coaches, parents and players of Badminton sports in India to gather their views and opinions. The questionnaire for coaches was shared with the sports academies and universities having Badminton as a sport. The questionnaire for players and parents was shared with Badminton players and parents of Badminton players, respectively, who participated atleast at the zonal

level.

3.2.4 Questionnaire Assessment

The establishment of reliability and validity of the data is essential before the relationships between constructs can be established and the accuracy of the prediction results can be examined. The convergent validity, discriminant validity and multicollinearity effects are verified for the measurement model.

3.3 Mediation Analysis using PLS-SEM

SEM analysis enables a researcher to model complex relationships with multiple independent and dependent variables. PLS-SEM is a non-parametric method that can work with small-size samples and complex relationships (Hair et al., 2021). Hence, no distribution assumption is required in PLS-SEM and it gives high efficiency and greater statistical power with small-size samples. Therefore, it is well suited for this work.

A two-step process is used in the PLS-SEM approach (Panigrahi et al., 2023). First is the measurement model and second is the structural model. In the measurement model, the reliability and validity of the constructs and their related indicators are tested. In the structural model, the relationships between independent, mediating and dependent constructs are assessed. After testing the measurement model, the structural model is examined as the structural model cannot be confirmed if the constructs are unreliable or invalid. Thus, in the measurement model, the indicators are examined with the constructs using a theoretical framework whereas in the structural model, the relationships between the constructs with each other are tested (Hair et al., 2021).

The mediation effect occurs when a third variable intervenes between the independent and dependent variables. Consider the mediation model given in Figure 3.2, a3 depicts the direct effect between the independent and dependent variable whereas $a1 \cdot a2$

depicts the indirect relationship between independent and dependent variables with the mediating effect of the mediating variable.

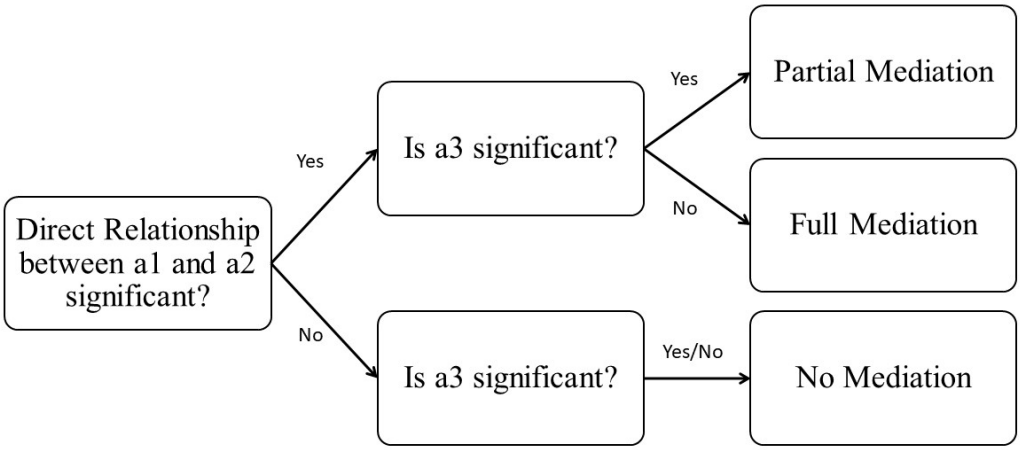


Figure 3.4: Steps in Mediation Analysis (Source: (Hair et al., 2021))

Figure 3.4 depicts the testing of the type of mediation. The mediation analysis is only conducted if the relationship between independent and dependent variables is significant without the mediation analysis. If the indirect effect a1 · a2 is significant, then the direct effect a3 is examined. If a3 is significant then there is partial mediation, otherwise there is full mediation. If a1 · a2 is not significant, whether direct effect a3 is significant or not, then there is no mediation effect in the relationship. The bootstrapping approach is used in this work which makes no assumption regarding the distribution of the samples and can be applied to smaller-sized samples. Figure 3.5 presents the evaluation criteria and measures used for testing the measurement and structural models.

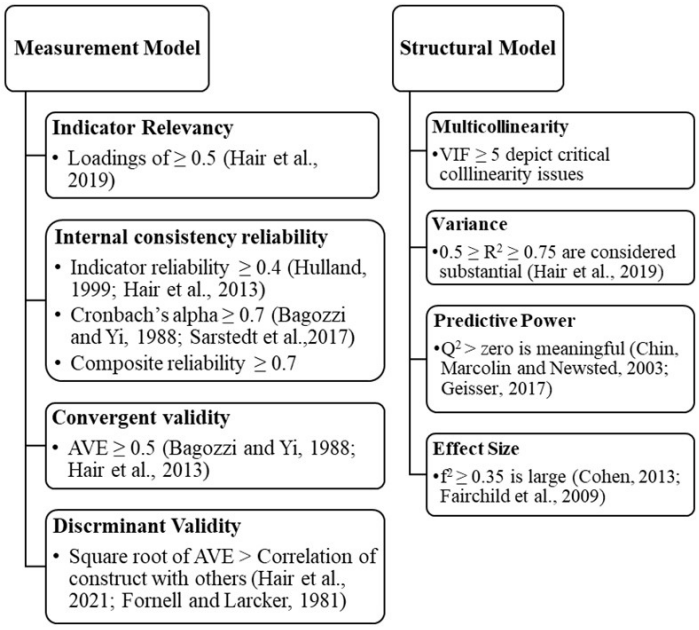


Figure 3.5: Steps in Mediation Analysis (Source: (Hair et al., 2019))

3.3.1 Measurement Model

The measurement model is verified for reliability and validity using indicator relevancy, internal consistency reliability, convergent validity and discriminant validity (Cheung et al., 2023; Verma et al., 2022). Figure 3.5 presents the threshold values of measures used for measurement and structural models. The factor loadings must be greater than 0.5 and the indicator reliability (measured as the square of factor loadings) should be more than 0.4 (Hair et al., 2019). The reliability of the measurement model is assessed using Cronbach alpha and composite reliability with a threshold not less than 0.7 (Henseler and Sarstedt, 2013). The indicator reliability is calculated by squaring the loadings with a threshold value greater than or equal to 0.4 (Hulland, 1999; Sarstedt et al., 2021). The convergent validity is validated using the Average Variance Extracted (AVE) that measures the amount of correlation between attributes within the same construct with an acceptable value greater than or equal to 0.5. It is calculated by taking an average of squaring the factor loadings of all the indicators corresponding to a particular construct.

The discriminant validity is assessed by checking that the loading with the same construct must be greater than the loadings with the other constructs (Fornell and Larcker, 1981). The square root of AVE must be greater than the correlation of the construct with other constructs.

3.3.2 Structural Model

After testing the measurement model, the structural model is tested. As shown in figure 3.5, multicollinearity values, checked using the Variance Inflation Factor (VIF), must be greater than the threshold of 5 (Hair et al., 2013). The bootstrapping method is used to check the relationship between constructs and test the hypothesis at a 0.05 significance level. The R^2 values represent the variance (Hair et al., 2019) representing the explanatory power of the model. The high values of R^2 indicate greater explanatory power. The predictive power is also estimated by blindfolding using Q^2 (Geisser, 1993; Stone, 1974). The difference between predicted and original values are represented by Q^2. The values of Q^2 greater than zero represent high predictive relevance (Henseler and Sarstedt, 2013). The effect size is measured in terms of F^2 and is given below:

$$F^2 = \frac{(RA^2 - RB^2)}{(1 - RA^2)}$$

RA^2 represent the value of R^2 of the model with mediation analysis and RB^2 represents the value of R^2 of the model without mediation analysis.

3.4 Summary of Study Design Methods

Table 3.2 presents the details of the study including nature, sample size, sampling technique, source of data, data analysis methods, instrument used for data collection, independent variables and dependent variable.

Table 3.2: Summary of Various Parameters

Nature of the Study	Mixed Method Approach
Sector	Sports Management & Player Preparation
Sample Size	School Children: 1590, Coach: 82, Parents: 314, Players: 754
Sampling Technique	Convenience Sampling
Sources of Data	Primary & Secondary Sources
Data Analysis Methods	Chi-square test, Logistic Regression, Linear Regression, PLS-SEM
Instrument used for Data Collection	Forms Questionnaire (Likert scale 1 to 5)
Independent Variables	Study 1: Physical Attributes; Study 2: Skill Set for Sports Coaches; Study 3: Parental Involvement; Study 4: Player Orientation
Mediating & Dependent Variable	Flat Feet, Knock Knees, Player Preparation, Sports Management

In this chapter, the research methodology that will be followed in this thesis is presented. The research questions, hypothesis, data collection strategies and data analysis methods given in this chapter will be used in the subsequent chapters.

Chapter 4

Physical Parameters and Effect on Sports Performance

Children with physical problems are often restrained from participating in sports activities and physical activities. Postural and foot deformities can lead to the malfunctioning of various parts of the body including knees, feet and legs. Flat feet or pes planus and knock knees or genu valgum are two common problems occurring amongst children (Dunn et al., 2004). The presence of flat feet and knock knees can negatively affect the quality of life and sports activities (Abdel-Fattah et al., 2006; Dabholkar and Agarwal, 2020). It can increase the risk of occurrence of injuries and the presence of musculoskeletal conditions (pain, fatigue, imbalance and uneven distribution of planer pressure) (López-López et al., 2021; Pita-Fernandez et al., 2017). Pediatric care reduces or eliminates the occurrence of flat feet and knock knees at an earlier age in children (Staheli, 2008).

Flat feet can be defined as a biomechanical problem in which arcs of the inside of the feet flatten and the sole touches the ground (López-López et al., 2021). Flat feet can cause feet or knee and back pain, balancing issues, fatigue and uneven distribution of planer pressure (Lovett and Dane, 1896). The most commonly occurring flat foot type is flexible flat feet (Lakstein et al., 2010). There are various reasons for the occurrence

of flat feet that include overweight, structural and musculoskeletal abnormalities, neuromuscular issues, family history and urban residency (Cappello and Song, 1998a,9). Knock knees are a condition when the knees are inward bend and knees touch each other even after an individual stand with ankles apart. Often the flat feet and knock knees can persist together and may negatively impact the lifestyle of an individual. There have been various studies analysing the association between personal characteristics and the presence of flat feet and knock knees among varied aged children (Al-shenqiti et al., 2020; Askary Kachoosangy et al., 2013; Bhoir, 2014; Chang et al., 2010; Daneshmandi et al., 2009; Eluwa et al., 2009; Ezema et al., 2014; Ganeb et al., 2021; Karimi-Mobarake et al., 2005; Korkmaz et al., 2020; Pashmdarfard et al., 2019; Pourghasem et al., 2016; Sadeghi-Demneh et al., 2015; Xu et al., 2022). The focus of this chapter is to examine the prevalence of flat feet and knock knees in primary school children. The chapter assesses 1590 children from two schools in Delhi, India aged 6 to 10 years. The age group selected is appropriate as at this age the development of arc and knee misalignment can be seen in children. In this chapter, we examine and analyse the research questions (RQ_{1a}- RQ_{1d}) given in section 3.1.4.1. In order to answer RQ_{1a} question, the data collected from schools is analysed in form of tables and charts. RQ_{1b} is answered using the chi-square test and univariate logistic regression analysis. The results of this RQ_{1c} are statistically analysed using the chi-square test. The results of this RQ_{1d} are qualitatively analysed using domain knowledge and existing literature. In the current literature, there are no studies, to the best of the author's knowledge that examine the prevalence of flat feet and knock knees amongst children in Delhi, India, and there are very few studies in total that examine the prevalence of knock knees.

The rest of the chapter is organized into the following sections: section 4.1 presents the details of the education campaigns carried out in schools. Section 4.2 presents participant characteristics, variables, hypothesis and methods used. Section 4.3 presents the answers to the research questions. Section 4.4 presents the summary of results along with theoretical and practical implications of this study. The results of the

chapter have been published in Mor et al. (2023a)

4.1 Management of Physical Attributes through Education Campaign in Schools

The results of this study are derived through carrying massive screening campaigns in schools. The duration of these campaigns was two months and each child was screened for the presence of flat feet and knock knees following the steps given below. The school management and parents were educated about these two important issues and with due consent of the parents to carry out the screening tests of the children. The children are assessed for the prevalence of flat feet and knock knees by a team of doctors who are experts in this area. The position of the child was examined multiple times to rule out even the slightest error in the detection of flat feet and knock knees in the school children. The summary of various assessment parameters including age, weight, gender, observations in standing position and the results of foot scan analysis were summarized in the form of performas. All the ethical practices were followed to perform the analysis. The screening and assessment at an early age amongst school children will not only provide information to parents but also will prevent the issue from being converted into a serious concern. Further, this information can be effectively factored by parents in choosing appropriate sports activities for their children.

The study is carried out in two schools in Delhi, India consisting of 1590 participants with 888 male children and 702 female children aged between 6 to 10 years. The two schools of Delhi were selected for analysis as they made compulsory the participation for children in sports events. Both the schools had earned laurels in the zonal or state level sports tournaments.

The physical examination of flat feet was carried out initially followed by photographic analysis (see Figure 4.1). Then, a foot imprinter plate was applied for foot scanning to analyse the presence of flat feet in the children. The portable foot imprinter plate had 2704 calibrated sensors, 5 Hz frequency, 100% digital calibration, -10 to +45 degree C temperature and 5% accuracy.

Knock knees have been assessed keeping the child in a standing position with fully extended knees. The distance between the medial malleoli at the ankle with knees touching each other was measured using a plastic and divider scale (>5 cm taken as knock knees) (Jankowicz-Szymanska and Mikolajczyk, 2016). This method is simple, reliable and prevents children from being exposed to radiation.

After examination, the expert team performed a careful analysis of the obtained parameters. With detailed reports, the parents and teachers were made aware of flat feet and knock knees and provided suggestive recommendations for exercises to the children.

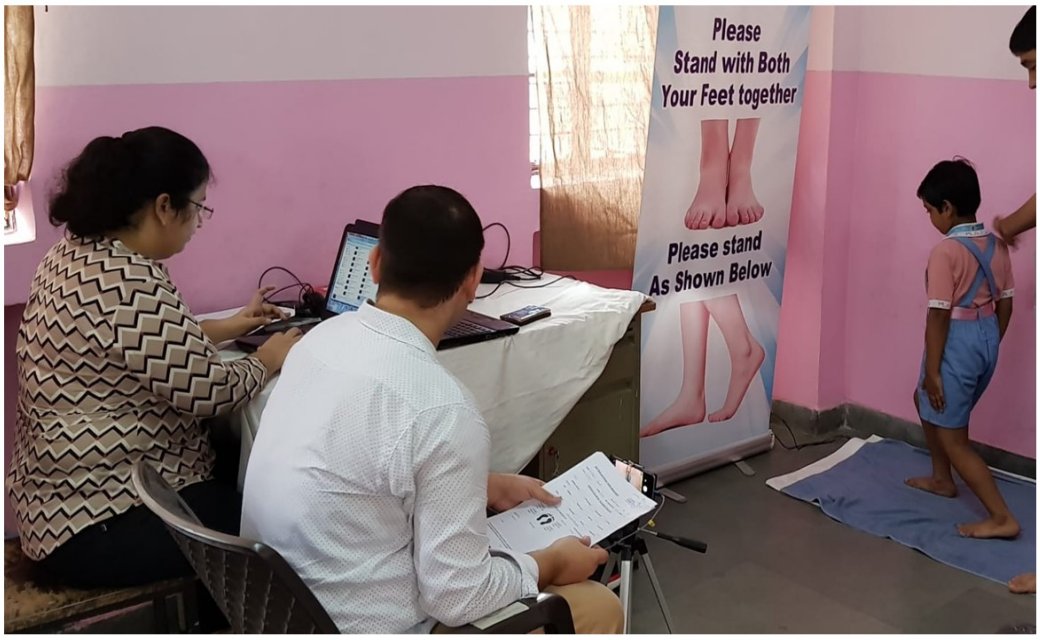


Figure 4.1: Foot Assessment in School

4.2 Research Background

In this section, the data collection process, participant characteristics, variables, hypotheses formation and details of statistical techniques used are presented.

4.2.1 Variables Used

The analysis of 1590 primary school children have been carried out from class I to V. The various variables such as age, gender and weight were collected along with the prevalence of flat feet and knock knees. The parents were completely made aware of the procedure of assessment and ethical permission was taken for the inclusion of the data.

4.2.2 Participant Characteristics Details

Table 4.1 summarizes the count with percentages of children with respect to age, gender, flat feet and knock knees. There were 24.77%, 20.31%, 21.38%, 18.99% and 14.53% children at the age of 6, 7, 8, 9, and 10, respectively. Out of 1590, 55.85% of children were male and 44.15% were female. A total of 68.8% of children were diagnosed with flat feet and 45.59% of children were diagnosed with knock knees. Table 4.2 presents the summary of descriptive characteristics (minimum, maximum, mode, mean, median, standard deviation and percentile) of children namely age and weight. The most occurring value in age is 6. .

4.2.3 Hypothesis Testing

In this chapter, the research hypothesis, H_{1a}-H_{1c}, H_{2a}-H_{2c}, H_3, formulated and stated in section 3.1.4.1 are tested.

Table 4.1: Characteristics of Participants

Variable	Value	Count (Percentage)
Age	6	394 (24.77%)
	7	323 (20.31%)
	8	340 (21.38%)
	9	302 (18.99%)
	10	231 (14.53%)
Gender	Male	888 (55.85%)
	Female	702 (44.15%)
Flat Feet	Normal Feet	496 (31.19%)
	Flat Feet	1094 (68.80%)
Knock Knees	Normal Knees	865 (54.4%)
	Knock Knees	725 (45.59%)

Table 4.2: Descriptive Statistics for Variables

Variable	Age	Weight
Mean	-	28.92
Median	-	27.00
Mode	6.0	-
Std. Deviation	-	10.00
Minimum	6.0	13.00
Maximum	10.0	78.00
Percentile 25	-	22.00
Percentile 75	-	35.00

4.2.4 Methods Used

4.2.4.1 Chi-square Test

In this chapter, we use the chi-square test to find an association between age and gender with flat feet and knock knees. The association between flat feet and knock knees is also analysed. The test has been applied at a level of significance of 0.01 level.

4.2.4.2 Univariate Logistic Regression

In this chapter, univariate analysis is carried out in which the individual effect of the independent variables is found on the dependent variable. The statistics reported for

each variable are coefficient (B), standard error (SE), statistical significance (Sign.), odds ratio (Exp(B)).

4.3 Analysis Results

In this section, the answers to the research questions formulated in this chapter are provided.

4.3.1 RQ_{1a}: What is the prevalence of flat feet and knock knees amongst primary school children?

The data collected from a total of 1590 primary school children of age between 6 to 10 years attending school in Delhi, India is analysed for the prevalence of flat feet and knock knees. There are a total of 888 male and 702 female children. Tables 4.3 and 4.4 present the prevalence of flat feet and knock knees with respect to age amongst school children, respectively. The results show that out of 1590 children there were 1094 children (639 males and 455 females) with flat feet and 725 children (415 males and 310 females) with knock knees. Thus, it can be seen from the data collected from two schools in Delhi that 68.8% of children were having flat feet and 45.59% of children were having knock knees. This implies that at least three in every five children had a flat foot and two in every five children had knock knees. The percentage of flat feet amongst school children is very high and corrective action is required to prevent it from becoming a serious health condition.

Table 4.3: Prevalence of Flat Feet with respect to Age

	6 years	**7 years**	**8 years**	**9 years**	**10 years**	**Total**
Normal Feet	115	103	104	109	65	496
Flat Feet	279	220	236	193	166	1094
Total	394	323	340	302	231	1590

Table 4.4: Prevalence of Knock Knees with respect to Age

	6 years	7 years	8 years	9 years	10 years	Total
Normal Knees	205	181	197	169	113	865
Knock Knees	189	142	143	133	118	725
Total	394	323	340	302	231	1590

Figure 4.2 depicts the percentage (%) of children having flat feet at various levels of age. The results show that there were 70.81%, 68.11%, 69.41%, 63.9%, and 71.86% of children aged 6, 7, 8, 9, and 10 years with flat feet, respectively. There is a minor difference in the presence of flat feet at the age of 6 to 10 years. The presence of flat feet is highest in school children at the age of 10 years. This may be because there is unawareness amongst the parents and children about flat feet and corrective action is not being taken at an early age. Figure 4.3 shows the percentage of male and female children with flat feet. It can be seen that at various age levels, about 57-60% of male children and 39-41% of females have flat feet. The percentage of male children having flat feet is greater as compared to female children. Similarly, figure 4.4 shows the percentage of male and female children with knock knees.

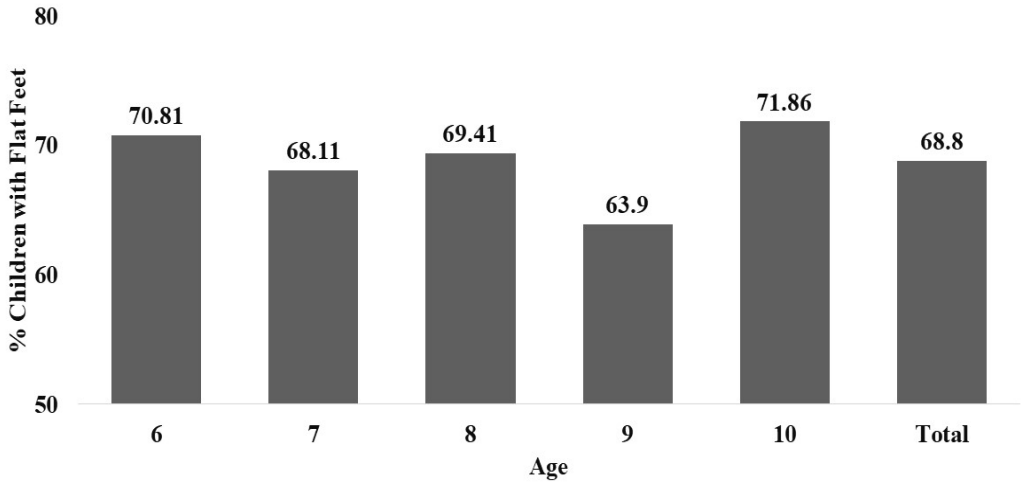
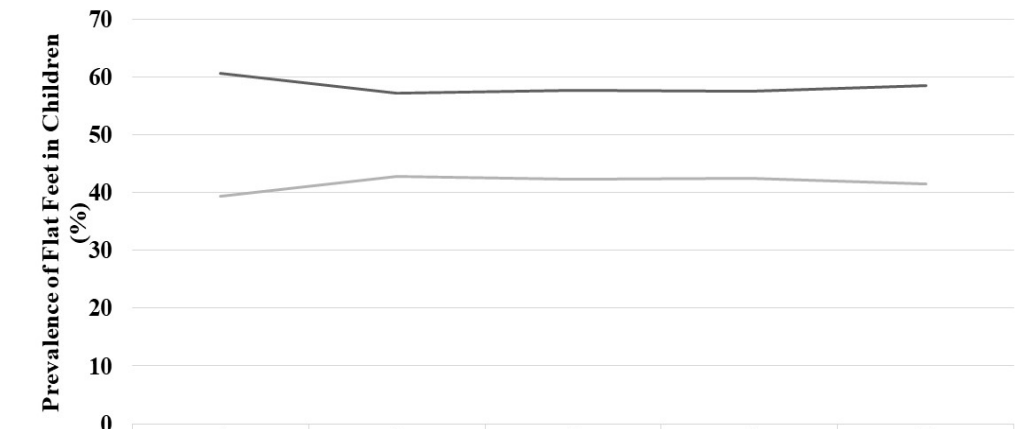


Figure 4.2: Percentage of Flat Feet amongst Children with respect to Age



	6	7	8	9	10
Male%	60.58	57.28	57.63	57.52	58.44
Female%	39.43	42.73	42.38	42.49	41.57

Figure 4.3: Percentage of Male and Female Children with Flat Feet

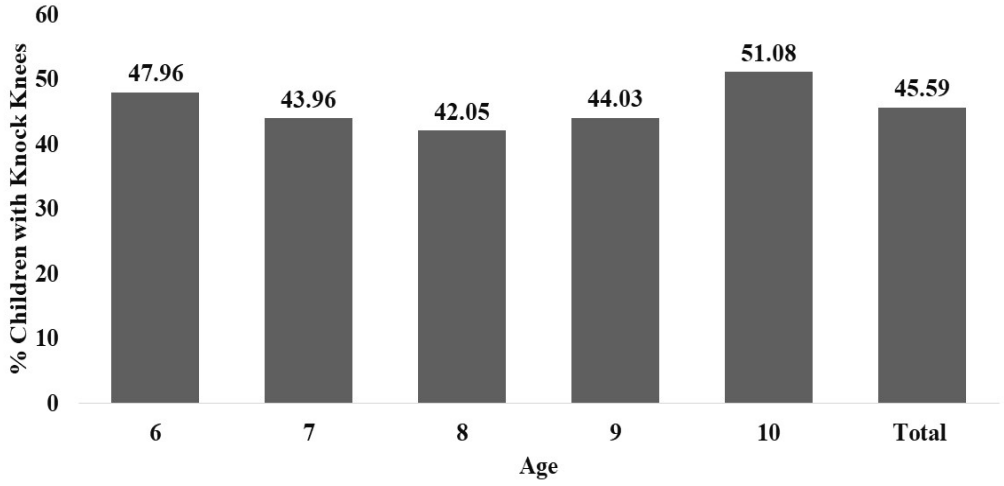
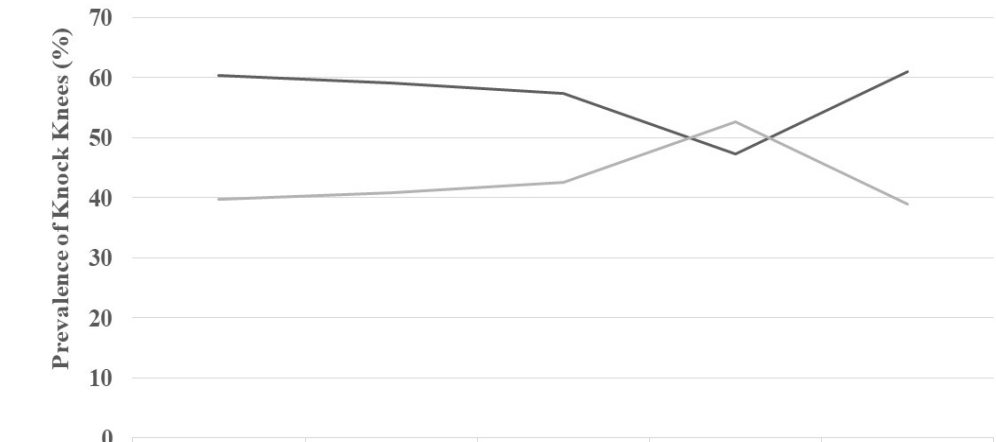


Figure 4.4: Percentage of Knock Knees amongst Children with respect to Age

Table 4.5 presents the comparison of the existence of flat feet and knock knees amongst school children in this study with related work. The table summarizes the country, participant count, participant age, and percentage of presence of flat feet and knock



	6	7	8	9	10
—Male%	60.32	59.16	57.35	47.37	61.02
—Female%	39.69	40.85	42.66	52.64	38.99

Figure 4.5: Percentage of Male and Female Children with Knock Knees

knees amongst the participants. The results show that the prevalence of flat feet and knock knees was very high in this work as compared to the previous studies with 68.8% and 45.59%, respectively. Only two studies showed a high prevalence of flat feet amongst children with 74% (Askary Kachoosangy et al., 2013) and 77% (Alshenqiti et al., 2020). The rest of the studies depicted the presence of flat feet between 13% - 28.9%. The prevalence of knock knees is about 2%-52% in the previous studies. Hence, immediate attention and measures are required to handle the high prevalence of flat feet and knock knees among primary school children in urban cities of India.

4.3.2 RQ_{1b}: What is the effect of age, gender and weight on the prevalence of flat feet and knock knees amongst primary school children?

In order to answer this research question, the chi-square test and univariate logistic regression are used. The hypothesis formed in section 4.2.2.1 is validated. The signifi-

Table 4.5: Comparison of Prevalence of Flat Feet and Knock Knees with Related Studies

Authors	Country	Study Size	Age	Flat Feet %	Knock Knees %
Our study	India	1590	6-10	68.8	45.59
Mobarake et al., 2005 [25]	Iran	3000	7-11	-	2
Daneshmandi et al., 2009 [10]	Iran	1180	12-15	23.5	-
Eluwa et al., 2009 [12]	Nigeria	1000	20-30	13.4	-
Chang et al., 2010 [8]	Taiwan	2083	7-12	59	-
Enrique et al., 2012 [13]	Columbia	940	3-10	15.7	-
Kachoosangy et al., 2013 [20]	Iran	945	7-12	74	-
Ezema et al., 2014 [14]	Nigeria	474	6-10	22.4	-
Bhoir et al., 2014 [4]	India	80	18-25	11.25	-
Rasheed and Pagare, 2015 [29]	India	25	9-14	-	32
Sadeghi-Demneh et al., 2015 [30]	Iran	667	7-14	17.1	-
Jankowicz-Szymanska and Mikolajczyk, 2016 [19]	Poland	1364	5-7	-	52
Pourghasem et al., 2016 [28]	Iran	1158	6-18	16.1	-
Pashmdarfard et al., 2019 [26]	Iran	1700	7-12	28.9	-
Al-shenqiti et al., 2020 [2]	Saudi Arabia	563	6-12	77	-
Ganeb et al., 2021 [15]	Egypt	4689	6-12	13.86	0.11

cance level of the chi-square test is 0.01. The chi-square statistics and significance level (in brackets) are specified in table 4.6. It is found in section 4.3.1 that male children are more with flat feet as compared to females. Tables 4.7 and 4.8 show

Table 4.6: Results of Chi-Square Test

	Age	Gender
Flat feet	4.883 (0.299)	10.061 (0.001)
Knock knees	6.11 (0.191)	0.999 (0.318)

the results of univariate analysis for finding the individual effect of age, gender and

weight on flat feet and knock knees. Table 4.7, it is shown that gender and weight are significantly related to flat feet and table 4.9 shows that weight is significantly related to knock knees. Hypothesis H_{1b} and H_{1c} are accepted. Thus, male children have more flat feet as compared to females and flat feet are likely to increase with higher weight in school children. Hypothesis H_{1a} is rejected. In the case of knock knees, hypotheses H_{2a} and H_{2b} are rejected and hypothesis H_{2c} is accepted. Thus, higher weight amongst school children is likely to increase the occurrence of knock knees.

Table 4.7: Univariate Logistic Regression Analysis Results for Flat Feet Variable

Variable	**B**	**SE**	**Sign.**	**Exp(B)**	**R^2**
Age	-0.024	0.039	0.532	0.976	0.000
Gender	0.340	0.109	0.002	1.405	0.009
Weight	0.029	0.006	0.000	1.029	0.019

Table 4.8: Univariate Logistic Regression Analysis Results for Knock Knees

Variable	**B**	**SE**	**Sign.**	**Exp(B)**	**R^2**
Age	0.009	0.036	0.808	1.009	0.000
Gender	0.101	0.102	0.318	1.107	0.001
Weight	0.079	0.007	0.000	1.083	0.138

Table 4.9 summarises the results of hypothesis testing. Mobarake et al. (2009) found that knock knees were more prevalent in girls than boys. However, in this study, it is found that the presence of knock knees is slightly higher in boys than girls but these results are not statistically significant.

The association between weight and flat feet has been established in Pourghasem et al. (2016) and the results show a significant effect of weight on flat feet. In Eluwa et al. (2009), it was found that the prevalence of flat feet was more in female students than in males. This may be because the authors considered 20-30 aged students and flat foot increases in females with age.

Table 4.9: Results of Hypothesis Testing

No.	Hypothesis	Decision
H_{1a}	The prevalence of flat feet amongst primary school children has a significant relationship with age.	Rejected
H_{1b}	The prevalence of flat feet amongst primary school children has a significant relationship with gender.	Accepted
H_{1c}	The prevalence of flat feet amongst primary school children has a significant relationship with weight.	Accepted
H_{2a}	The prevalence of knock knees amongst primary school children has a significant relationship with age.	Rejected
H_{2b}	The prevalence of knock knees amongst primary school children has a significant relationship with gender.	Rejected
H_{2c}	The prevalence of knock knees amongst primary school children has a significant relationship with weight.	Accepted

4.3.3 RQ_{1c}: What is the relationship between flat feet and knock knees with respect to primary school children?

In order to answer this question, the chi-square test was used so that the association of flat feet and knock knees can be examined and hypothesis H_3 can be validated. Table 4.10 presents the cross-tabulation to summarize the relation between flat feet and knock knees. The table shows that 580 children have both flat feet and knock knees. As can be seen, 80% of children having knock knees also have flat feet while 53% of children having flat feet were also having flat feet. The value of the chi-square statistic is 77.81 with a 0.00 significance level. Hence, the prevalence of flat feet amongst children having knock knees is greater, thus hypothesis H_3 is accepted as the relationship is found to be significant. The reason can be that if having knock knees while walking the weight is transferred to the inside part of the feet which makes it overloaded resulting in flattening of the arc converting into flat feet.

Table 4.10: Cross Tabulation of Flat Feet and Knock Knees

	NK	**KN**	**Total**
NF	351	145	496
FF	514	580	1094
Total	865	725	1590
KN: Knock Knees, NK: Normal Knees, FF: Flat Feet, NF: Normal Feet			

4.3.4 RQ_{1d}: What is the effect of flat feet and knock knees in sports activities and suggestive measures for preventing flat feet and knock knees amongst children?

The analysis of data collected from primary school children shows that there are 1094 (68.8%) and 725 (45.59%) children with flat feet and knock knees, respectively. The high number of children with flat feet and knock knees is a matter of concern and a "red" signal for parents and children. The initial sign of flat feet and knock knees can become a serious issue at a later older age. The prevalence of flat feet can affect the quality of life by causing health issues (pain, gait problems, foot fatigue), limiting physical mobility (walking, running, exercising, balance) and other complications (injury, fractures, arthritis) (Dabholkar and Agarwal, 2020; López-López et al., 2021; Pita-Fernandez et al., 2017; Sharma and Upadhyaya, 2016). Similarly, the presence of knock knees can lead to knee pain, flat feet, difficulty in walking or running, knee arthritis, and instability of knees.

Flat feet and their relationship with the formation of foot arc and biomechanics of the lower extremities may affect walking, jumping, running, balance and coordination which are the most important factors involved in the training and performance of a player (Bhosale and Nandala, 2021). Players with flat feet are more prone to low performance, foot and knee injuries, calf fatigue, fractures, spasms during exercising due to exertion of higher load and pressure on feet than usual (Korkmaz et al., 2020). Many times, a player only comes to know about the presence of flat feet while playing

a specific sport. In the study carried out by Sharma and Upadhyaya the running performance of a player with a flat foot is analysed and it is concluded that the running performance decreases due to a reduction in ankle muscle strength (Sharma and Upadhyaya, 2016). Similarly, in sports, the presence of knock knees is a cause of concern in players as a player grows physically more pressure is exerted on the knees. This study has been conducted as a part of an educational programme in schools where knee and foot assessments of children aged between 6 to 10 years have been carried out with the aim to educate and communicate with parents and children. This is done by providing the parents with information and knowledge about their child's feet and knee condition so that they can understand and provide extra care at this initial age as flat feet and knock knees may become a cause of concern as the child grows older. Hence, a check should be kept that the flat feet or knock knees that could have been easily removed by precautions and easy exercises at an earlier age do not become permanent as the child becomes older. The aim of the educative programme was also that the information provided can be further used for effectively deciding on the pursuit of sports now and in the future. Thus, the following suggestive measures are recommended to be taken at a large scale at rural and urban schools:

1. Annual screening and assessment of flat feet of primary school children for prevention of foot and postural deformities at an early age.

2. Conducting mass educative programmes for parents and children so that information and knowledge about dealing with flat feet and knock knees can be provided at an early age. Parental education is essential to encourage children to play on natural surface.

The above measures will help in preventing the permanent occurrence of flat feet and knock knees, thus, improving quality of life and non-hindrance in physical and sports activities in the coming generations.

4.4 Discussion of Results

4.4.1 Summary of Results

In this work, an assessment of 1590 children from two schools is carried out with children of 6 to 10 years of age for the prevalence of flat feet and knock knees. The main results are summarized as follows:

1. The assessment showed that there are 68.8% of school children having flat feet and 45.59% of children having knock knees. There were three in every five children and two in every five children with flat foot and knock knees, respectively. Thus, immediate attention is required to address this important issue amongst primary school children.

2. The results showed that gender and weight are related to the prevalence of flat feet and weight is related to the presence of knock knees in children.

3. It has been found that 80% of children with knock knees also had flat feet.

4. The flat feet and knock knees adversely affect the mobility of children in terms of walking, running, balancing and hence may hinder their participation in particular sports activities. Hence, educational programmes and screening of children in schools must be carried out for the prevention and early cure of flat feet and knock knees amongst school children. This will not only improve the quality of life but also guide the parents about the participation of their children in appropriate sports.

This chapter is important from the viewpoint that the phenomenon of flat feet and knock knees has been examined simultaneously, which has not been done hitherto.

4.4.2 Theoretical Significance

The study highlights the presence of two important problems in school children namely flat feet and knock knees. The purpose of the study was to analyse the presence of flat feet and knock knees among children aged between 6-10 years. The results show that 68.8% and 45.59% of school children had flat feet and knock knees, respectively. In the study, gender was found related to flat feet and weight was found to be related to both flat feet and knock knees.

4.4.3 Practical Significance

If flat feet and knock knee problems in children are not detected at an early stage and it is left untreated, then there is a high risk of health issues such as knee pain, foot pain, injury of the knee, muscle spasms, fracture, lower back pain, poor performance while exercising. Footwork and balance are key elements in any sport which includes badminton, basketball, and tennis. The flat feet will lead to a lack of strength which will become a hindrance in becoming a successful player. The player with flat feet will be more prone to injuries. The physical fitness of the player is essential in raising the success rate of the country in international sports. The results of the study can be used by the parents, health care professionals and sports personnel to focus on the important issue of flat feet and knock knees by conducting awareness drives, and educational programmes to sensitize about these issues so that treatment can be provided in time to the children.

Chapter 5

Coach Skill Set for Sports Management

To prepare successful players a battery of sports experts such as nutritionists, coaches, and physiotherapists are required (Beck et al., 2015; Cushion et al., 2003; Wright et al., 1991). Every player has a different skillset as per player's body type, flexibility, agility, endurance and strength. A coach understands this difference and tries to enhance the skillset of each player with the help of supporting staff. The role of a coach in building a player is extremely important. In this work opinions and perceptions of Badminton coaches on matters that are related to education, skill set, team preparation, training of the players, nutrition and general administration are gathered through a questionnaire. The analysis of the relationship between fitness attributes and sports management is important so that efforts can be applied to enhance these attributes. The inferences drawn from the data collected through the questionnaire will guide the sports authorities in India to effectively design training and educational programmes for coaches and develop a framework for sports management. It will also help to allocate various player preparation responsibilities to the desired professional. Further, this study will help the authorities to focus on appropriate training parameters for player preparation. The study analyzes the coach's perspective on the importance of

the education of coaches and its effect on sports management. The study examines the importance of four important training attributes namely agility, flexibility endurance and strength from the coach's perspective. Further, the amount of workload of the coaches for building players is also examined. The research questions given in section 3.1.4.2 (RQ_{2a}-RQ_{2f}) are examined in this work. In RQ_{2a}, we summarise the responses to the questions corresponding to the education construct using a bar chart. Further, to answer this research question, the individual effect of coach education and experience on sports management is found using univariate linear regression. In the RQ_{2b}, the individual effect of four constructs namely agility, flexibility endurance, and strength on sports management using linear regression. The importance of agility, flexibility, endurance and strength are analysed using the responses to these questions from coaches using a pie chart (RQ_{2c}). The answer to this RQ_{2d} is presented using a table and graph reflecting the responses from the questionnaire. The RQ_{2e} is answered using the coach's responses from the questionnaire. The RQ_{2f} is answered based on the suggestions received from the coaches in response to the questionnaire. The answer to the RQ_{2g} is summarised using the suggestions from the coaches given in the questionnaire in the form of tables. In order to answer the research questions, a well designed questionnaire is used to collect responses from coaches. The responses are obtained from 82 coaches across India.

The remaining chapter is structured as follows: section 5.1 presents the research background including the coach questionnaire, participants details and content validation and section 5.2 presents the questionnaire validation results. Section 5.3 presents the results of the study. In section 5.4 the summary of the results, the theoretical and practical significance of the results are discussed. The results of this chapter have been published in (Mor et al., 2023b)

5.1 Research Background

5.1.1 Variables Used

There are six IVs: education, experience, flexibility, agility, endurance and strengthening and the DV is sports management. A total of 25 factors are used to capture these IVs. The questionnaire is developed on these constructs to capture the coach's perspective on education, experience and various training attributes.

5.1.2 Questionnaire Content Validation

A careful analysis was carried out by a team of experts to check the content validity of the questionnaire. Two expert coaches and two professors were given the initial questionnaire to check the relevancy and representation of the constructs of the questions. All the questions marked as essential and relevant by the experts were retained in the questionnaire.

5.1.3 Coach Questionnaire

As described in section 3.2, the questionnaire consists of two sections. The first section (Section A) focuses on demographic information such as the age, gender, qualification, and experience of the coaches. The second section (Section B) includes questions on education, experience, flexibility, agility, endurance, strengthening and sports management. A total of 27 questions were created belonging to these 7 constructs. Table 5.1 presents the questions included in the questionnaire. A Likert scale of five-point (1-Strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree) was used to measure the responses to these questions.

Table 5.1: Coach Questionnaire

Construct	Indicator	Description
Education	E1	Is formal education in sports coaching required to develop a player?
	E2	In your opinion whether diploma/certificate in sports coaching from Apex organization highly contribute to sports management?
	E3	Whether there should be a coach education training programme?
Experience	EX1	Participation in National sports tournament helps to gain high knowledge for player preparation?
	EX2	Whether participation in international sports tournament helps to gain high knowledge for player preparation as a coach?
	EX3	In your opinion playing experience of a coach is an effective factor for player preparation?
Flexibility	F1	Flexibility important for appropriate player preparation
	F2	Active stretching led to high flexibility
	F3	Passive stretching contributes to high flexibility
	F4	Specialist supervision for stretching is highly recommended
Agility	A1	Agility is important for appropriate player preparation
	A2	T Test for agility play an important role in developing Player
	A3	The frequency of sessions per week required for agility development in player high
	A4	Specialist supervision for agility is highly recommended

Endurance	E1	Endurance is important for effective player preparation
	E2	Individual endurance enhancing sessions contribute highly to player preparation
	E3	Group endurance enhancing sessions contribute highly to player preparation
	E4	The frequency of sessions per week required for endurance development in player should be high
	E5	Specialist supervision for endurance is highly recommended
Strengthening	S1	Strength and conditioning important for player preparation
	S2	Individual sessions for strength building contribute high towards player preparation
	S3	Group sessions for strength building contribute high towards player preparation
	S4	Focus on game-specific strength highly recommended
	S5	Focus on general strength is highly recommended
	S6	Specialist supervision for strengthening is highly recommended
Sports Management	SM1	Appropriate skill set of coaches lead to sports management
	SM2	Sports management organizations have well defined roles and responsibilities for player preparation

5.1.4 Questionnaire Participants Details

The participants in this study were Badminton coaches across India as described in section 1.2.4. The data collection was carried out from October 2022 to December 2022 by sharing a Google Form with the participants from various sports academies through email. The sports academies having Badminton as a sport was selected for

sharing the questionnaire. The data has been received from 82 Badminton coaches and their characteristics have been summarized in table 5.2. All the responses were complete and are retained in the analysis. As can be seen, 89% of participants were between the age group of 20 to 30 years with 90% of coaches having 0 to 10 years of experience. The number of players handled by 58% of coaches was more than 11.

Table 5.2: Characteristics of Participants in Coach Questionnaire

Characteristic	**Value**	**Number#**
Age (years)	20-30 31-40	73 9
Gender	Male Female	79 3
Coaching Experience (years)	0-10 11-20	74 8
Number of Players handling Experience in Current Position	0-10 11-20 21 and above	34 12 36
Educational Level	Diploma Undergraduate Postgraduate	03 75 04

5.1.5 Hypothesis Testing

The results of hypotheses testing (H_{4a}-H_{4f}) are presented in this chapter. The 0.05 significance level is used to assess the impact of each IV on DV.

5.1.6 Method Used

In this chapter, we use univariate linear regression to find the individual effect of each attribute on sports management. The statistics reported for each attribute are coefficient (B), standard error (SE), statistical significance (Sig.) and R^2.

5.2 Questionnaire Validation Results

5.2.1 Common Method Bias

Correlation analysis was used to check the common method bias. Previous studies suggested that a correlation of intra-constructs is to be performed and a correlation higher than 0.90 depicts the presence of common method bias. In this study, the highest correlation amongst the constructs was 0.45. Hence, the common method bias does not seem to be present in this work.

5.2.2 Reliability Analysis

The Cronbach alpha test was used to examine the reliability of the questionnaire which in this case was 0.789, reflecting the high reliability of the questionnaire (Gliem and Gliem, 2003).

5.2.3 Multicollinearity Analysis

The values of VIF greater than 5 depict the presence of multicollinearity. The VIF value was below 5 which indicates that multicollinearity was not present in the constructs (Hair et al., 2014).

5.3 Analysis Results

In this section answers to the research questions formed in section 3.1.4.2 are provided.

5.3.1 RQ_{2a}: What is the coach's perspective on education and experience of coaches?

5.3.1.1 What is the coach's perspective on the educational training programmes for coaches?

It can be seen from the bar chart (Figure 5.1) that 51% of respondents were neutral in response to having a formal education in sports and 54.8% of respondents were neutral in response to possessing a diploma/certificate from an apex organisation. However, 73% of respondents either strongly agreed or agreed that there should be a coach education training programme. About 47% of coaches emphasized having a formal education, about 43% of coaches advocated certificate programmes from apex organisations and more than 70% of coaches agreed that coach education programmes should be conducted. This shows that the coaches in India need to be trained with well-designed educational and training programmes so that effective coaches who can contribute to the player's performance and communicate more effectively can be produced.

5.3.1.2 What is the relationship between education and experience with sports management from the coach's perspective?

Table 5.3 presents the results of univariate linear regression analysis to find the relationship between coach education and experience with sports management. The hypothesis H_{4a} and H_{4b} are accepted stating that coach education and experience are positively related to sports management. The significance level is 0.05. The statistics reported for each attribute are coefficient (B), standard error (SE), statistical significance (Sig.) and R^2.

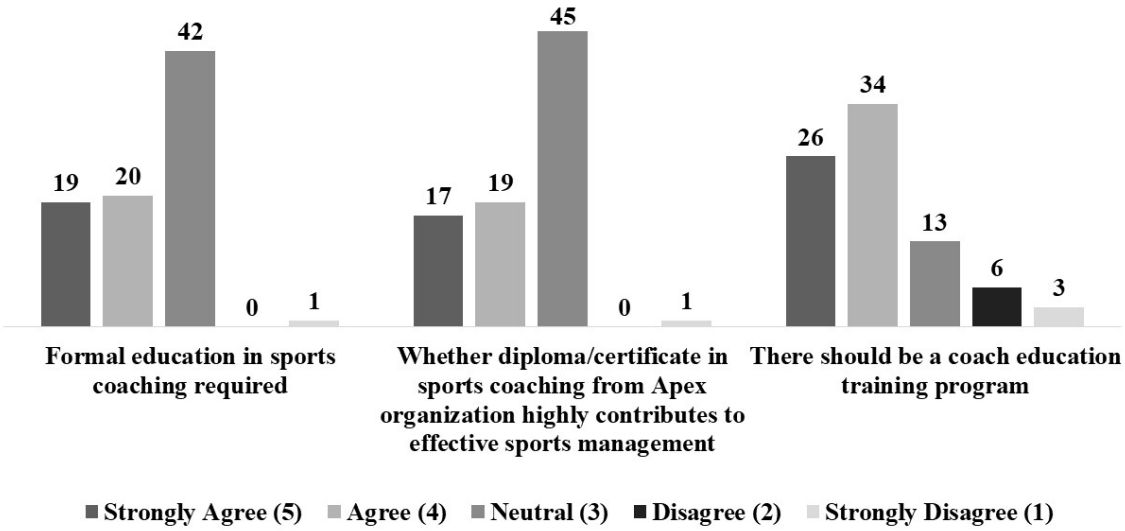


Figure 5.1: Perspective of Coaches on Coach Education and Training programmes

Table 5.3: Univariate Analysis using Linear Regression to Analyse Relationship of Coach Education and Experience with Sports Management

Construct	B	SE	Sig.
Education	0.309	0.090	0.001
Experience	0.467	0.133	0.001

5.3.2 RQ_{2b}: What is the importance of agility, flexibility endurance and strength for appropriate player preparation from the coach's perspective?

Figure 5.2 depicts the responses of the coaches on the importance of agility, flexibility, endurance and strength. The results collected from responses obtained show that 97%, 98%, 94% and 98% of coaches either strongly agree or agree that agility, flexibility, endurance and strength are important for player preparation, respectively. Thus, the focus of training players should be on these attributes so that player performance can be enhanced.

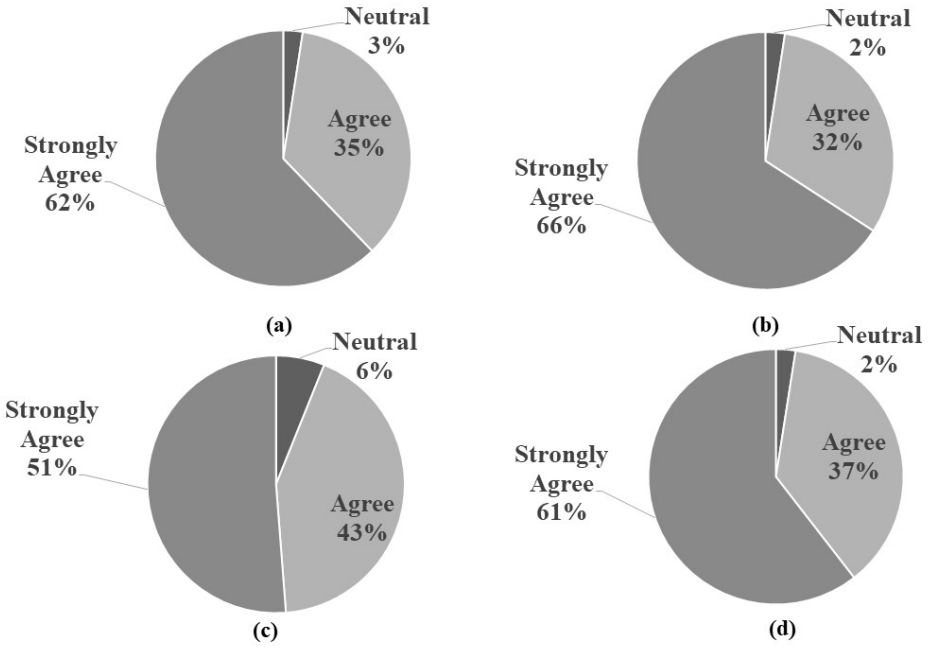


Figure 5.2: Coach's Perspective on Importance of (a) Agility (b) Flexibility (c) Endurance (d) Strengthening for Player Preparation

5.3.3 RQ_{2c}: What is the effect of training attributes such as agility, flexibility endurance and strength on sports management?

The individual effect of each training attribute is found on sports management. The results of univariate linear regression are shown in table 5.4. The results show that flexibility, agility, endurance and strength are significantly related to sports management with a 0.05 significance level. The hypothesis H_{4c}-H_{4f} (section 3.1) stating that player agility, flexibility, endurance and strengthening are positively related to sports management are accepted. The results are in support of the opinion shared by coaches. We also applied multivariate linear regression by using the forward method and the R^2 reported was 0.577 which signifies the effective contribution of training attributes for sports management.

Table 5.4: Univariate Analysis using Linear Regression to Analyse Relationship between Training Attributes and Sports Management

Construct	B	SE	Sig.
Flexibility	0.357	0.157	0.026
Agility	0.601	0.138	0.000
Endurance	0.671	0.158	0.000
Strength	0.636	0.143	0.000

5.3.4 RQ_{2d}: Is specialist supervision required for agility, flexibility, endurance and strength training for player preparation from the coach's perspective and who is responsible for the preparation of nutrition plans for the players?

Figure 5.3 depicts the coach's perception of the requirement of specialised supervision for handling agility, flexibility, endurance and strength training for player preparation. The results obtained from the responses show that 92%, 90%, 88%, and 88% of coaches either strongly agree or agree that specialist supervision is strongly recommended for enhancing agility, flexibility, endurance and strengthening of the players, respectively. Specialised training programmes and the engagement of specialists for enhancing these training attributes can lead to improvement in the performance of Badminton players. Figure 5.4 shows that 74% of coaches themselves handled the nutrition plans of players, 13% of coaches and nutritionists together handled the nutrition plans of players and 12% of coaches revealed that specialised nutritionists were responsible for handling the nutrition plans of players. The results show that a very less, only 12%, percentage of sports organizations and academies have separate nutritionists to handle the nutrition plan of the players.

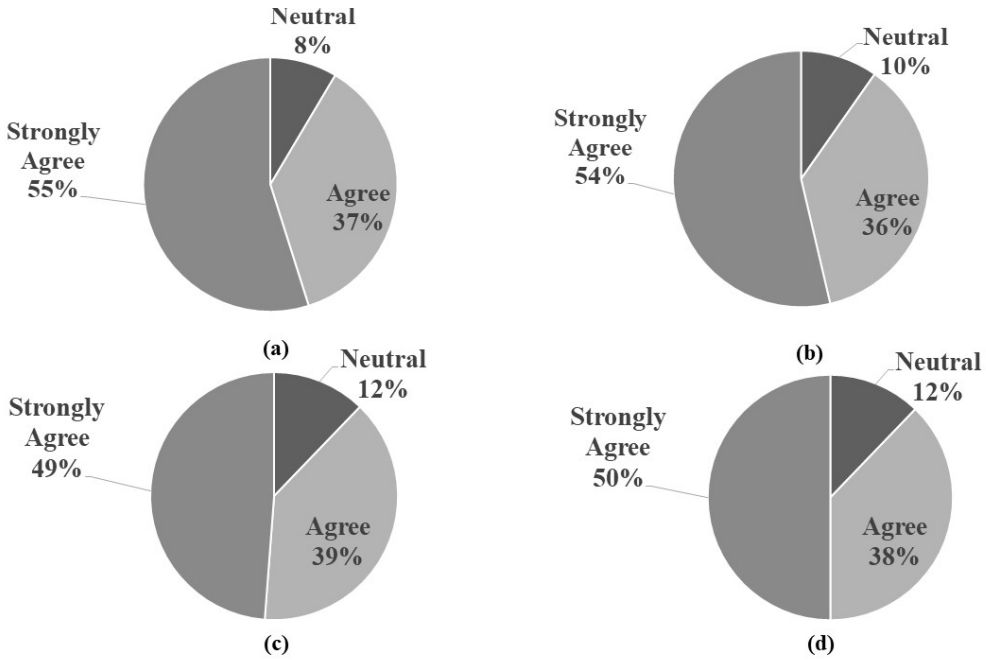


Figure 5.3: Coach's Perspective on Requirement of Specialist Supervision on (a) Agility (b) Flexibility (c) Endurance (d) Strengthening Training for Player Preparation

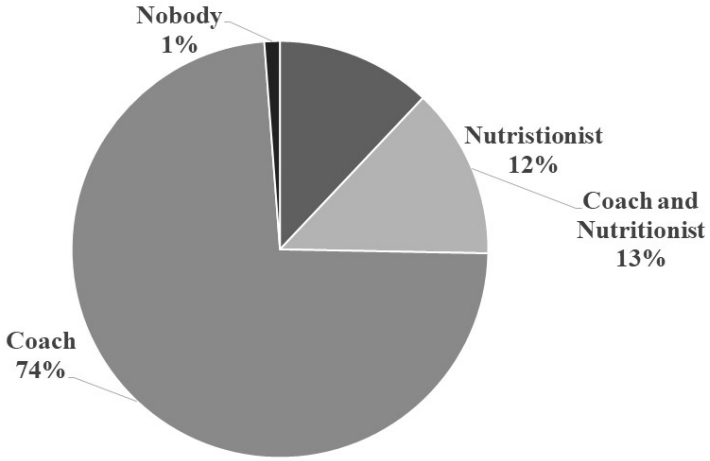


Figure 5.4: Responsibility of Handling of Nutrition Plans of Player

5.3.5 RQ_{2e}: Whether the coach is overloaded or have too much time spent with players?

The results of the responses to the question are shown in figure 5.5. It can be seen that 40% of respondents strongly agree, 27% of the respondents agree, 25% of the respondents were neutral, 7% of the respondents disagree and 1% of the respondents strongly disagree that they feel overloaded or have too much time spent with the players. This shows that the majority of the training activities are being handled by the coaches and measures may be taken to reduce the overloading of work by the sports authorities in India.

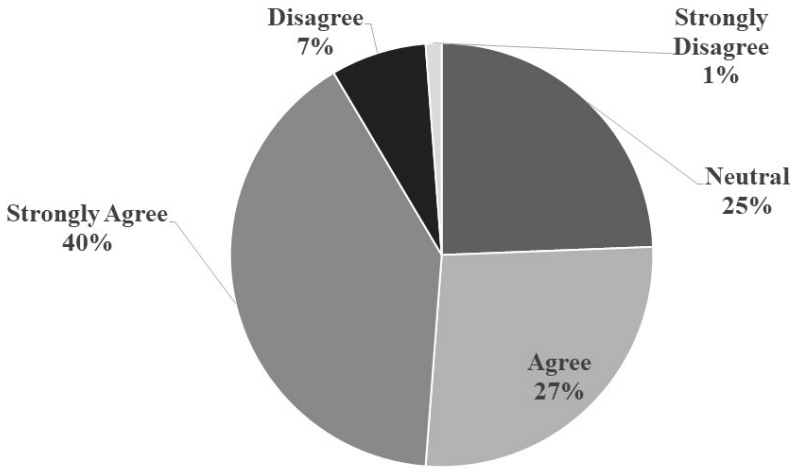


Figure 5.5: Coach's Perspective on being Overloaded with Time Spent on Players

5.3.6 RQ_{2f}: What are training requirements for players preparations from the coach's perspective?

The training requirements for the preparation of the players and other suggestions given by the coaches are summarized in table 5.5. The table depicts the training

requirement/ suggestions along with the frequency of occurrence of the suggestion. The most frequently occurring suggestion by the coaches is the fitness training of players. Agility, endurance, strength and footwork training are suggested by the coaches. The coaches also emphasize counselling and mental training sessions for the players. Tournament exposure and experience are also suggested by a few coaches. The suggestions given by the coaches can help the sports management authorities and academies to plan and manage the sessions of the players so that efficient sports players can be developed in India.

Table 5.5: Summary of Training Requirements and Suggestions for Players by Coaches

Specific Training Requirements and Suggestions	**Frequency of Suggestion**
Specific training sessions for correction of mistakes	02
Agility training	04
Endurance training	04
Shadow practice sessions	05
Strengthening	04
Fun games	01
Counselling sessions and pressure handling techniques	05
Coach availability during sessions	01
Tournament exposure and experience	03
Monthly coach evaluation	01
Swimming, Gym and Yoga	03
Fitness training	17
Cooldown sessions	03
Footwork training	05
Parent education	01
Injury prevention	01

5.4 Discussion of Results

5.4.1 Summary of Results

This chapter analyses a questionnaire on the coach's skill set to enhance sports management activities for effective player preparation. In this work, the results of a survey of 82 Badminton coaches are reported with the aim to analyse the importance of coach education programmes, coach experience and fitness attributes (agility, flexibility, endurance and strength) on player preparation. The results of the questionaries are summarized as follows:

1. There were about 47% of coaches emphasized having a formal education, about 43% of coaches advocated certificate programmes from apex organisations, and more than 70% of coaches agreed that a coach education programme should be conducted. Thus, coaches preferred informal education programmes over formal education sports.

2. More than 90% of coaches either strongly agreed or agreed on the importance of agility, flexibility, endurance and strength for player preparation.

3. The education and fitness attributes were found to be related to sports management.

4. About 90% of coaches either strongly agreed or agreed on the requirement of specialist supervision for agility, flexibility, endurance and strength for player preparation. It was revealed by the responses to the questionnaire that only 12% of qualified nutritionists are being used for preparing nutrition plans for players.

5. The coaches emphasized the training of players specifically in fitness, footwork agility, endurance, stress and mental abilities.

It is recommended that specialised coach training programmes should be conducted and specialists trained in various areas such as agility, flexibility, endurance, strength, and nutrition management should be appointed for enhanced player performance. This will further enhance the continuous efforts made by sports management organizations in India.

5.4.2 Theoretical Significance

The analysis of the importance of agility, flexibility endurance, and strength reveals that all four training parameters namely agility, flexibility, endurance and strength are extremely important for player preparation from the coach's perspective. The results of the responses to the questionnaire show that more than 70% of coaches agree that specialist supervision is required for the agility, flexibility, endurance and strength training of a player and a further 67% of coaches are having the opinion that they are overloaded with time being spent on preparation of players.

5.4.3 Practical Significance

The overloading of coaches may lead to stress, work-life imbalance and less job satisfaction that may negatively affect or hinder the performance of players (Dimitrios et al., 2013). The results of the questionnaire reveal that coach education training programmes and the experience of a coach's participation in national and international tournaments will enhance the knowledge of a coach leading to effective player preparation.

Also, 74% of coaches revealed that the coach himself was responsible for preparing the nutrition plans for the players. Keeping in view the above findings, the following guidelines are suggested for the sport management authorities and sports academies may take into account the enhancing and improvising the process for player preparation and providing support for increasing the effectiveness of coaches in Badminton

sports:

1. Designing effective small-scale and large-scale coach-training programmes focusing on flexibility, agility, endurance and strength will be highly beneficial for sports management in India.

2. The education of coaches must be reviewed and a well-defined programme should be developed in India so that effective coaches who can contribute to the player's performance and communicate more effectively can be produced. Studies have shown that coach training and educational programmes have increased the knowledge of coaches and a better understanding of players (Falcão et al., 2012; Falcao et al., 2020; Trudel et al., 2010).

3. Planning of involvement of specialists as per the individual need of a player is essential.

4. The sports management authorities must consider appointing specialists for handling the agility, flexibility, endurance and strength training sessions of the players.

5. There must be separate nutritionists to prepare and manage the nutrition plans of the players.

The results of this chapter can be used by coaches for improving the training sessions of the players and the suggestions given by the coaches in section 5.3.6 be used to improve sports management. The sports authorities and academies can use these results to further improvise the facilities, training programmes and assignment of responsibilities to personnel.

Chapter 6

Parental Orientation Towards Sports

The players are exposed to a wide variety of stresses ranging from performance pressure, training stress, injuries, attending tournaments, opportunity to play and so on (Alexe et al., 2021). Parent involvement in providing emotional and financial support is essential in improving physical activity to promote life satisfaction levels (Zuo et al., 2022). The role of parents in the preparation of a player cannot be ignored while aiming at creating an effective framework for sports management.

Parental support is an important contributing factor to the development and success of a player. The active involvement of parents in sports provides emotional support throughout the sports career of a player. This will enable a player to play their natural game with full enjoyment and without any mental pressure. Moreover, parents are responsible for introducing the sports to the children at the initial age alongwith economic support, equipment cost, transportation, and training expenses (Timperio et al., 2013).

Several studies advocate the positive involvement (unconditional love, motivation, performance praise) of parents in discussing and monitoring the sports activities of their children (Brière et al., 2020; Fraser-Thomas and Côté, 2009; Fredricks and Eccles, 2004; Knight et al., 2016; Lev et al., 2020). A parent must support the child clearly and objectively in achieving their goals effectively. The parents must keep a balanced

involvement in child's career (Thrower et al., 2022). They should regularly discuss the game-related progress, motivate the child in games and even motivate the child when they play badly. The parents adequately bear the cost of equipment, training, and transportation of the child and ensure that they enjoy the game and maintain an equal balance in sports and social life (Eime et al., 2013). In addition to the emotional and financial support from parents, societal accolades and support are equally important in the overall development of a player (Stalsberg and Pedersen, 2010). The literature suggests that social and psychological support increases the performance of a player (Morrissey et al., 2015). Although emotional, financial and social support are essential components, to the author's best knowledge, there had been no work that extensively relates these important constructs with player preparation and sports management.

For this, in this chapter, we designed a questionnaire in order to measure the emotional, financial and social support extended to a player from the parent's perspective. The effect of emotional, financial and social support on player preparation is evaluated and its combined effect on sports management is analysed and assessed. The effect of these essential factors on player preparation will not only play an important role in the creation of an effective framework for sports management, but it will also guide the sports management authorities in improving the schemes and providing financial grants to the players. This will also be a guide for parents and society to effectively support the process of player preparation on various parameters. Finally, the enhancement in the process of creation of players will lead to accolades, medals and recognitions for the nation. It is essential to strengthen and improve agility, endurance, flexibility, strength, nutrition, mental alertness. It leads to improved emotional well-being, movement, balance, posture, and anaerobic capacity (Mor et al., 2023b; Pamungkas et al., 2022; Ratamess, 2011) of a player. Thus, the role of a team of qualified professionals working on a player to improve various attributes is extremely significant in the preparation of a player. Keeping this in view, there were additional questions identified to capture the parental view on the current responsibili-

ties of the coach, the requirement of separate specialists in various domains such as physiotherapists, psychologists, nutritionists, yoga instructors, massage therapists and general physicians, government schemes and financial policies. Further suggestions from parents were sought for improving government policies and facilities in sports academies in India. The data is collected from 314 respondents, the parents of players, across various states in India in Badminton sports. The relationships are analysed using the PLS approach, The research questions, RQ_{3a}- RQ_{3e}, are answered in this chapter.

The rest of the chapter is organised into the following sections: Section 6.1 presents the variables, parent questionnaire, participant details and hypotheses for testing. Section 6.2 summarises the procedure and results of validity assessment. Section 6.3 presents the answers to the research questions and section 6.4 presents a discussion of the results.

The results of this chapter have been published in (Mor et al., 2023b).

6.1 Research Background

The involvement and contribution of parents play an important role in the creation of a player. In order to ensure that a sports management framework is developed, it is important to gather the views of the player's parents so that adequate support can be provided in the process of creating a player. In this chapter, the effect of emotional, financial and social support on player preparation and sports management is explored. In this section, the factors used in this work are discussed in detail.

6.1.1 Variables Used

A total of 25 factors are used in this work to capture 3 IVs, one MV and one DV. The attributes are used to capture the emotional, financial and social aspects of the player from the parent's perspective. The attributes are classified as emotional support,

financial support and social support as IV, player preparation as the MV and sports management as the DV. Player preparation is used as a mediating variable to evaluate sports management. The 25 factors are identified based on theoretical studies and professional expertise. The questionnaire is developed based on the constructs to capture the parental perspective. The hypotheses are developed to test the relationship between various factors with MV and DV. The factors/questions are identified after a thorough discussion with various stakeholders including parents, leading players in the country, and academicians. The hypotheses are developed between the IV, MV and DV to find the effect of emotional, financial and social support on sports management. The PLS approach is used to verify the hypotheses.

6.1.2 Questionnaire Content Validition

As described in section 3.2.2, the content validity of the questionnaire is done by electronically sharing the questionnaire with two internationally reputed players and their parents and two professors in the related field. They analysed the content of the questionnaire and provided feedback on the questions. The validity of the constructs and matching of the items with the constructs were also examined by the experts. The suggestions received were well incorporated into the questionnaire.

6.1.3 Parent Questionnaire

A questionnaire is designed to validate the relationships and answer the RQs. The questionnaire consists of primarily six sections. The first section collects the demographics of the player's parents. The second section focuses on the emotional support provided to the player. The next section consists of aspects related to financial support extended to the player. The fourth section focuses on social support. The next section comprises questions on player preparation and sports management. Finally, questions related to obtaining feedback from parents on the requirement of separate specialists,

government schemes and finances and capturing their opinion on improvement in training facilities and financial schemes. The questionnaire consists of a five-point scale point (1-Strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree) for measuring the responses of the parents. A Google form through email from 20 April 2023 to 4 May 2023 has been canvassed to the parents of Badminton players in India to gather their views and opinions. The active involvement of parents in the sports of the child provides concrete support to the child. The first construct, emotional support, consists of 8 questions related to the active involvement of parents in the training sessions, game discussions, and motivational support to the children (Bonavolontà et al., 2021; Park and Kim, 2014; Schwebel et al., 2016; Teques et al., 2018). In addition to providing emotional support, the parents are responsible for bearing the cost of training, equipment, transportation and other expenses of the children. The financial support construct is measured through the questions related to the ease with which the expenses are managed by the parents, the equipment available at the sports training academy and the bearing of equipment cost (Bibi et al., 2016; Timperio et al., 2013). Societal support from family and friends is also one of the important components in improving the performance of a player (Morrissey et al., 2015; Stalsberg and Pedersen, 2010). There are four questions related to social support in Table 6.1.

Parental orientation towards sports as a career will have a significant association with sports management and the relationship is mediated by player preparation strategy. Technical preparation and psychological preparation are two important components of player preparation. Player preparation is measured by the adequacy of handling of mental pressure, performance and skill development of the child from the parent's perspective. It consists of five questions given in table 6.1. Player preparation has a mediation effect between IV (emotional, financial and social support) and DV (sports management). Sports management has four questions that consist of goal achievement, ranking in tournaments and overall development of the child.

Table 6.1: Parent Questionnaire Constructs and Attributes

Construct	Indicator	Type	Description
Emotional Support	E1	IV	Your involvement in your child's training is significant
	E2	IV	You regularly attend your child's training sessions
	E3	IV	After a game, you tell your child regarding improving his/her performance
	E4	IV	Do you regularly discuss sports with your child
	E5	IV	You encourage your child even if he/she played badly
	E6	IV	You encourage your child to talk about any game-related problem
	E7	IV	After a game, you praise your child, for his/her performance
	E8	IV	You discuss the progress of your child with his/her coach
Financial Support	F1	IV	To manage the financial expenditure of the sports of your child comfortable for you
	F2	IV	There is enough training equipment present at the academy
	F3	IV	You able to bear equipment costs for the practice of your child
	F4	IV	Your cost of putting your child in sports is worth enough of the benefits gained
Social Support	S1	IV	Your child gets adequate societal support for selecting sports as a career
	S2	IV	In your opinion sports as a career accepted by the society
	S3	IV	Winning small tournaments bring societal acknowledgment and appreciation
	S4	IV	Your child gets motivation from family and friends for playing

Player Preparation	PP1	MV	Your child is able to handle the mental pressure adequately
	PP2	MV	The performance of your child is adequate
	PP2	MV	Your child is enthusiastic about learning new skills
	PP4	MV	Your child masters something that he/she was not able to do previously
	PP5	MV	You are satisfied with the skill development of your child
Sports Management	SM1	DV	Your child is able to achieve his/her goals with respect to sports
	SM2	DV	Your child gives his/her best during the tournament or championship
	SM3	DV	Your child's ranking in international or national sports events adequate
	SM4	DV	You are satisfied with the overall development of your child
Other relevant questions	What are the responsibilities of the coach (agility, endurance, flexibility, strengthening, nutrition plans, relaxation sessions)? In your opinion which should have separate specialists for your child's training programme, in addition to a coach? (physiotherapist, nutritionist, psychologist, yoga instructor, massage therapist, general physician) Your child's ranking in international or national sports events adequate Financial support is given by the government for your child's training Execution or governing Body of sports management in our country are making continuous efforts for sports effectiveness Financial support for the participation of your child in sports events is provided by the academy What are your suggestions for improvement in training or facilities at the sports academy? What are your suggestions for improvement in financial schemes or support by the government?		

6.1.4 Questionnaire Participants Details

The data is collected from 314 respondents. The respondents are the parents of Badminton players who have atleast participated in the zonal level tournaments. The characteristics of these respondents are summarized in table 6.2. 73% of respondents were the father of the players atleast playing at the zonal level. There were only 7% of players playing at the international level. 41% of parent respondents had a UG degree.

Table 6.2: Characteristics of Respondents

Factor	**Value**	**Number of Responses**	**% of Responses**
Gender	Male	229	73%
	Female	85	27%
Income Level	10000-50000	123	39%
	50000-100000	86	27%
	100000-200000	60	19%
	$>$ 200000	45	15%
Educational level	10th	27	9%
	12th	45	15%
	UG	127	41%
	PG	91	29%
	Ph.D	24	8%
Level at which child participating/ participated	Zonal	117	37%
	State	79	25%
	National	97	31%
	International	21	7%
Whether a parent has played Professional sports in life	Yes	165	53%
	No	149	47%
Child's age group	11-15	125	40%
	16-20	143	46%
	21-25	42	13%
	$>$ 25	4	1%

6.1.5 Hypothesis Testing

The research process includes the formation of research questions and hypothesis development as given in 3.1.4. In this chapter, the hypotheses (H_{5a}-H_{5i}) presented in

section 3.1.4.3 are tested. The direct and indirect effect is analysed between constructs and mediation analysis is done through the PLS approach. The impact of each IV on MV and DV at a 0.05 significance level is analysed.

6.2 Validation Assessment Results

For establishing the reliability and validity of the measurement model the measures used are summarised in section 3.3.1. Table 6.3 shows the values of loadings, indicator reliability, Cronbach alpha, composite reliability and AVE. The range of Cronbach alpha is between 0.742-0.904 for all the constructs. The range of values of composite reliability is 0.836-0.921. The values of AVE are greater than 0.5. The results of discriminant validity are shown in table 6.4. The values of the VIF are less than the threshold of 5 depicting tolerable collinearity effects (Hair et al., 2013). Hence, the results depicted the reliability and validity of the measurement model and constructs.

6.3 Results Analysis

In this section, the answers to the RQ formed in this chapter are provided.

6.3.1 RQ_{3a}: What is the effect of emotional, financial and social support on sports management with the mediation effect of player preparation from the parent's perspective?

The answer to this RQ is computed using the PLS approach (Cepeda-Carrion et al., 2018; Chin et al., 2003; Panigrahi et al., 2023). The reflexive measurement path model is developed (Hair et al., 2013) and the predictive assessment of the model is evaluated. The Emotional (E), Financial (F) and Social (S) support are the IV. Player Preparation (PP) is treated as MV and SM as DV. The R^2 values and path coefficients are used to

Table 6.3: Construct Validity

Construct	Indicator	Loadings	Indicator Reliability	Cronbach's Alpha	Composite Reliability	AVE
Emotional Support	E1	0.805	0.65	0.904	0.921	0.597
	E2	0.714	0.51			
	E3	0.851	0.73			
	E4	0.701	0.50			
	E5	0.780	0.61			
	E6	0.829	0.69			
	E7	0.868	0.76			
	E8	0.700	0.49			
Financial Support	F1	0.702	0.50	0.758	0.845	0.580
	F2	0.703	0.50			
	F3	0.863	0.75			
	F4	0.792	0.63			
Social Support	S1	0.802	0.65	0.742	0.836	0.562
	S2	0.775	0.61			
	S3	0.713	0.51			
	S4	0.701	0.50			
Player Preparation	PP1	0.764	0.59	0.869	0.905	0.659
	PP2	0.914	0.84			
	PP3	0.701	0.50			
	PP4	0.808	0.66			
	PP5	0.881	0.78			
	PP6	0.764	0.59			
Sports Management	SM1	0.921	0.85	0.815	0.881	0.653
	SM2	0.732	0.54			
	SM3	0.700	0.49			
	SM4	0.892	0.80			

Table 6.4: Discriminant Validity

	E	**F**	**PP**	**S**	**SM**
E	0.772				
F	0.512	0.762			
PP	0.444	0.502	0.812		
S	0.388	0.517	0.397	0.750	
SM	0.462	0.582	0.758	0.430	0.808

evaluate the performance of the model with player preparation as a mediating variable and without player preparation as a mediating variable.

Table 6.5 depicts the results of the causal effect relationship between IV and DV.

Tables 6.5 and 6.6 present the values of coefficients, mean values, standard deviation, T statistics and significance values of relationships. It also reports confidence interval values at 2.5% and 97.5%. The results show that emotional, financial and social support have a positive impact on both player preparation and sports management, supporting hypotheses H_{5a}-H_{5f}. Table 6.6 shows the direct relationship between the IV and DV considering the mediation effect. It can be seen that emotional and social support becomes not significantly related to sports management in direct effect analysis considering the mediation effect of player preparation. The effect of this is to be interpreted as the full or partial mediation effect of player preparation.

Table 6.5: Results of Direct Effect Analysis (without mediation effect)

Relationship	**Original Sample**	**Sample Mean**	**Std. Dev.**	**T Statistics**	**P Values**	**2.50%**	**97.50%**
E -> PP	0.217	0.219	0.071	3.065	0.002	0.068	0.358
F -> PP	0.316	0.318	0.081	3.892	0.000	0.146	0.459
S -> PP	0.157	0.160	0.078	2.026	0.043	0.000	0.318
E -> SM	0.183	0.188	0.057	3.177	0.002	0.078	0.293
F -> SM	0.412	0.412	0.059	7.046	0.000	0.299	0.522
S -> SM	0.152	0.154	0.063	2.392	0.017	0.022	0.266

Table 6.6: Results of Direct Effect Analysis using Mediation Analysis

Relationship	**Original Sample**	**Sample Mean**	**Std. Dev.**	**T Statistics**	**P Values**	**2.50%**	**97.50%**
E -> PP	0.229	0.236	0.071	3.205	0.001	0.092	0.367
E -> SM	0.062	0.068	0.046	1.358	0.175	0.096	0.327
F -> PP	0.308	0.317	0.083	3.689	0.000	0.147	0.461
F -> SM	0.223	0.220	0.073	3.042	0.002	0.298	0.522
S -> PP	0.149	0.138	0.073	2.038	0.042	0.499	0.704
S -> SM	0.054	0.052	0.049	1.098	0.273	-0.002	0.274
PP -> SM	0.596	0.601	0.052	11.432	0.000	0.012	0.254

The rationale for including player preparation as a mediation variable is that effective player preparation will lead to the overall sports management of a player. The mediation effect of player preparation on the relationship of IV with sports management is shown in table 6.7. The results of mediation analysis show that

emotional, financial and social support are significantly related to sports management given the mediation effect of player preparation.

Table 6.7: Indirect Results of Mediation Analysis

Relationship	Original Sample	Sample Mean	Std. Dev.	T Statistics	P Values
E -> PP -> SM	0.137	0.141	0.04	3.414	0.001
F -> PP -> SM	0.184	0.192	0.059	3.125	0.002
S -> PP -> SM	0.089	0.083	0.045	1.969	0.049

Table 6.8 shows an increase in the R^2 values of the model after adding player preparation as a mediating variable. Table 6.9 presents the results of the hypothesis testing of relations between the variables. The value of F^2 denotes the impact of the inclusion of MV on the relationship between IV and DV (Cohen, 2013). The value of F^2 is 0.505 which shows the strong impact of the inclusion of player preparation as MV on sports management. The value of Q^2 is 0.404 which is greater than zero confirming the predictive power of the model (Geisser, 1993). The results of hypothesis testing

Table 6.8: Model Validation Results

	R^2
Direct with SM	0.316
With PP as a mediating variable	0.634

using bootstrapping procedure are summarised in table 6.9. H_{5a}-H_{5f} are accepted at a 0.05 significance level. The hypotheses H_{5g}-H_{5i} related to mediation relation are accepted. Hypothesis H_{5g} and H_{5i} depict full mediation as emotional support and social support becomes not directly related to sports management after adding player preparation as a mediating variable. Hypothesis H_{5h} depicts partial mediation as financial support is both directly and through the mediator related to sports management. The values of coefficients are higher with mediation relation than with direct relation of IV with DV. The values of the coefficient of financial support (see tables 6.6 and 6.7) show that it has the most significant impact on sports management as compared

to emotional support and social support. The results confirm the mediating effect of player preparation on sports management.

Table 6.9: Hypothesis Testing Results

No.	Hypothesis	Decision	Mediation Effect
H_{5a}	Emotional support has a positive impact on player preparation	Accepted	-
H_{5b}	Financial support has a positive impact on player preparation	Accepted	-
H_{5c}	Social support has a positive impact on player preparation	Accepted	-
H_{5d}	Emotional support has a positive impact on sports management	Accepted	-
H_{5e}	Financial support has a positive impact on sports management	Accepted	-
H_{5f}	Social support has a positive impact on sports management	Accepted	-
H_{5g}	Player preparation has a mediation effect between emotional support and sports management	Accepted	Full Mediation
H_{5h}	Player preparation has a mediation effect between financial support and sports management	Accepted	Partial Mediation
H_{5i}	Player preparation has a mediation effect between social support and sports management	Accepted	Full Mediation

6.3.2 RQ_{3b}: What are the current responsibilities of the coach and in what area separate trainer is required from the parent's perspective?

Agility, endurance, flexibility and strengthening are four essential attributes for training a player. Figure 6.1 shows the responses of parents regarding the responsibilities of a coach. According to the responses, 78%, 75%, 51% and 69% of coaches were responsible for agility, endurance, flexibility and strengthening, respectively. Figure 6.2 presents the responses of the parents regarding the requirement for specialists in various domains. The results show that 73% of parents advocated the requirement of

a physiotherapist for their children. 71% of parents stressed the presence of separate nutritionists for planning and monitoring the nutrition plans of the players. Similarly, the requirement of a psychologist, yoga instructor, massage therapist and general physician was advocated by 61%, 62%, 61% and 59% of parents, respectively. Hence, separate specialists are required for effective player preparation according to the responses received by the parents.

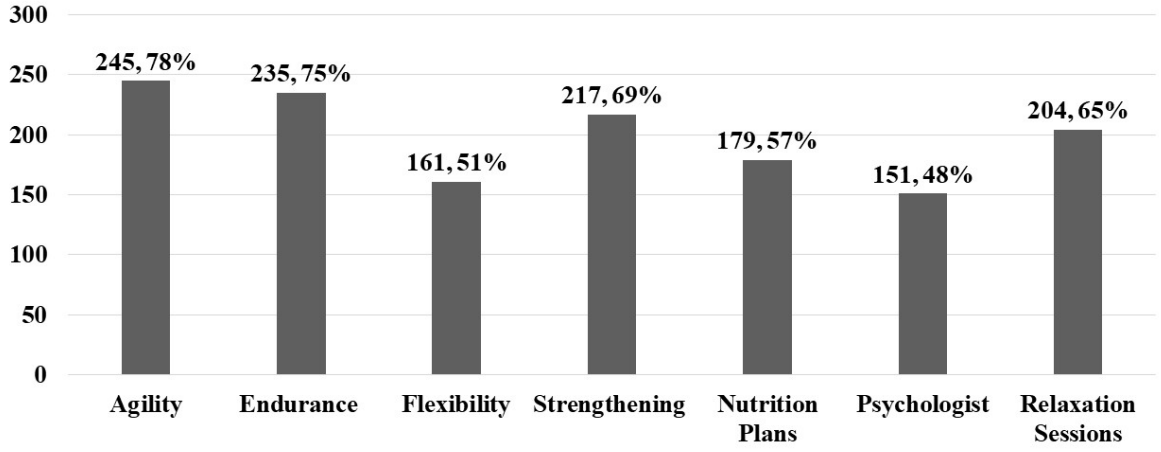


Figure 6.1: Parents' Perspective regarding the Responsibilities of the Coach

6.3.3 RQ_{3c}: What is the satisfaction level of the player's parents with the government schemes?

Figure 6.3 shows the satisfaction level of parents with the government schemes and the continuous effect of execution bodies being made in India for increasing sports effectiveness. 41% of players' parents either disagree or strongly disagree on the satisfaction with the financial schemes by the government. However, 49% of players' parents either strongly agree or agree with the continuous efforts being made by the executive bodies to increase the effectiveness of sports in India. Hence, more focus

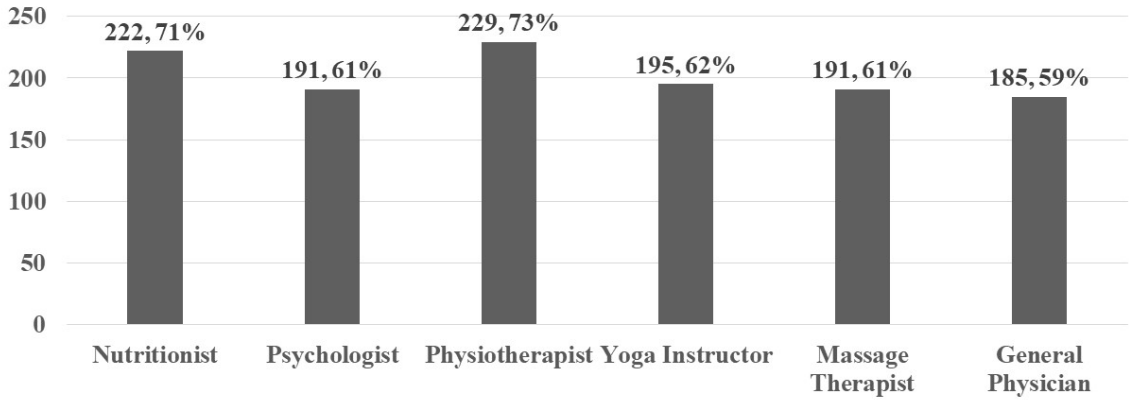


Figure 6.2: Parents' Perspective Regarding the Requirement of Separate Specialists

may be given by the sports execution or governing bodies on improving the financial schemes for the players so that the effectiveness of sports management can further be improved in the nation.

6.3.4 RQ_{3d}: From the parent's perspective is there any financial support provided to the players?

As the results depict that financial support is one of the key factors in player preparation leading to sports management. Figure 6.4 presents the results of financial support received by the players from the government and sports academies in training the players and participation in sports events. There were 63% of players' parents either strongly disagree or disagree with the financial support being received by the government for the training of the children. Similarly, 40% of parents either strongly disagree or disagree with the financial support being received by sports academies for the participation of children in sports competitions. Thus, the financial support

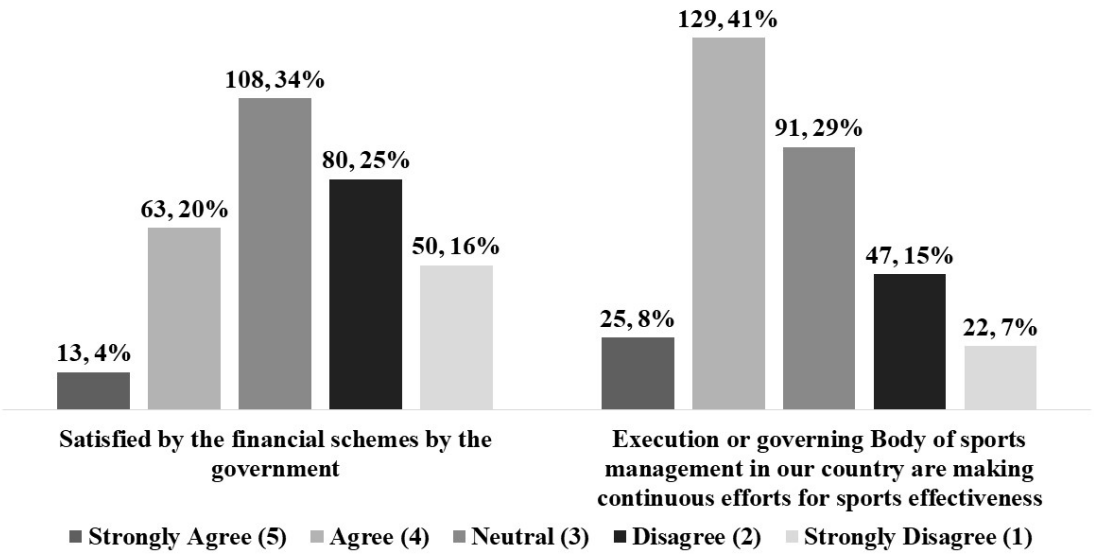


Figure 6.3: Parents' Responses on Government Schemes

being received by the players is not adequate and more work must be done at all levels to devise schemes for improving the financial grants to the players for training and participation of the players in national and international sports events.

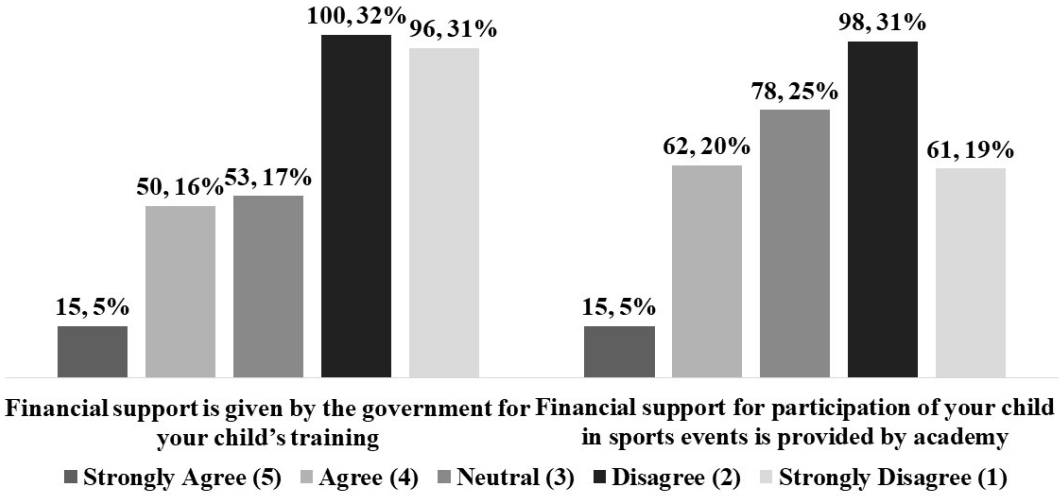


Figure 6.4: Parents responses on Financial Support

6.3.5 RQ_{3e}: What are the suggestions of parents for improving training facilities and national financial schemes?

In this section, the summary of the suggestions for improving the training facilities and financial schemes by the government agencies are summarized in tables 6.10 and 6.11. Table 6.10 shows that most of the parents suggested that the training equipment in the academy must be sufficient, improved and advanced. The parents stressed on the well-planned, customized and focused plans for the children. The parents also emphasized the presence of separate physiotherapists and nutritionists in the academies. Another important aspect is children having interactive sessions with coaches and coaches to deliver players motivational sessions and small appreciations to keep their spirits high. The parents further highlighted the presence of a full team of qualified professionals working on the preparation of the players. It was suggested that the opportunities for participation in national and international competitions must increase for players.

Table 6.11 summarises the suggestions given by the parents for improving government financial schemes and other related support for the players. The most frequent suggestions from the player's parents include that the government must provide funding from the initial career of the player (zonal level) so that the process of player preparation becomes more effective and the grants are provided when much needed by the player. New schemes and grant policies can be introduced by the government to strengthen the training of the players. Scholarships to meritorious and needy players may also be constituted by the government. Many parents also emphasized an increase in tournaments and opportunities for players.

Table 6.10: Parent's Suggestions for Improving Facilities at Sports Academy

Suggestions for improvement in training or facilities at the sports academy	Frequency of Suggestion
Focus on mental health or mental training of player (Psychologist)	04
Separate physiotherapist at the academy	08
Separate nutritionist for the nutritional management	08
Separate massage therapist	01
Team of qualified professionals for sports management	05
Agility support	01
More efforts are required for fresh players	04
Well-planned and focused schedules (road map) and proper career guidance	12
Government monitoring and checking	02
Video analysis	01
Use of enough, improved and advanced/modern equipment	31
Better playground and courts (synthetic)	06
Unbiased selection approach when sending players to national competitions	02
Performance based financial support and incentives	06
Increase in the number of coaches	03
More opportunities for playing in national and international competitions	04
Coach interactive sessions and motivational support	12
Coach fee reduction	01
Improvement in coach training, knowledge and education	08
Workload management	02
Meditation sessions (weekly)	01
Relaxation sessions	03
Government funding for equipment	02
Injury prevention and management measures	02
More focus on international events	01

6.4 Discussion of Results

6.4.1 Summary of Results

In this work, we designed and assessed a questionnaire for collecting player's parents opinions on emotional, financial and social aspects extended to the children for sports management. The data was collected from 314 parents of Badminton players from

Table 6.11: Parents' Suggestions for Improving the Government's Financial Schemes

Suggestions for improvement in financial schemes or support by the government	**Frequency of Suggestion**
Increase in grants, financial schemes and fund allocation	16
Government should fund registered academies	01
Investment in sports education	01
Yearly player performance funds	01
Increase in tournaments and opportunities for players to play	06
Creation of sports schools and facilities at schools	03
More support in player preparation than providing support after reaching the national level. Financial schemes and aids must start from the zonal level	13
Financial support for nutritionists and physiotherapists	01
Educative programmes for the promotion of government schemes	02
Sports quota increase	01
Government should visit the school and colleges regularly for the inspection of the sports facilities and provide them with the needful	01
Financial support and scholarships for needy and meritorious players	10
Monitoring of existing funds allocated	01
Post-retirement job support for national players	01
Skilled coaches	02
Travelling, equipment and food support for national and international tournaments	01
More opportunities for playing at national and international tournaments	03
Yoga instructors and well-trained physical education teachers at the school level	01
Rich sports culture at the university level	02
Financial support for injury management	01
Transparent system for allocation of funds	01

various states across India through email using Google form. The parental support extended to the children in terms of sports-related discussions, attending training sessions, motivation after losing a game, and discussion with the coach is considered. The financial support was assessed in terms of financial support extended to the children in terms of ease of management of sports-related expenses, ability to

bear the cost of equipment, training equipment at the sports academy. Social support was calculated by considering the societal acceptance of sports as a career and the support extended by family and friends. The chapter analysed the impact of player preparation, as a mediating variable between emotional, financial, social support and sports management. The results are evaluated using the PLS approach.

1. The results of the chapter confirmed the mediating effect of player preparation on the relationship between emotional, financial, social support and sports management. Emotional support and social support were not found related to sports management when player preparation was added as a mediating variable depicting the full mediation effect of player preparation. Financial support was found to have the most significant impact on sports management. The R^2 was improved significantly when player preparation was added as a mediating variable. The results showed that 41% of parents are not satisfied by the financial schemes of the government and 63% of parents disagree with the financial support being received by the government for the training of their children.

2. The results showed that parents advocated the need for separate physiotherapists, psychologists, massage therapists, yoga instructors and general physicians. The financial support was also found to be less from the sports agencies. There were various suggestions given by the parents for improving the facilities at the sports academy and financial schemes by the government. These suggestions include the creation of a team of qualified professionals including physiotherapists, psychologists, nutritionists, and massage therapists. The parents also suggested for allocation of funds at the initial level in the career for potential players. The focus of the coach in the planning of a player's career was also emphasized. In addition, an increase in the participation of players in national and international

tournaments was suggested by the parents.

3. Based on the feedback obtained from parents, there must be a team of qualified professionals including specialized trainers, physiotherapists, psychologists, nutritionists, yoga instructors, massage therapists and general physicians focusing on different aspects of the player for improving sports management in India.

4. Further, regular coach education and parents training programmes must be conducted. Also, the financial schemes of the government for supporting players must be reviewed and improved

.

6.4.2 Theoretical Significance

The results of the chapter lead us to the inference that player preparation has a positive impact on sports management. The chapter shows that emotional, financial and social support positively impact the process of player preparation that further enhances sports management. The emotional support given by parents in terms of discussion of sports, motivating the child, discussion with the coach, and attending training sessions improves the mental health and performance of the player. It also improves the child's ability to learn and master new skills. This results in an overall improvement in tournament performance, achievement in player goals and national and international ranking and overall development of a child.

Financial support has been shown to have a significant impact directly and indirectly on improving the child's tournament performance, sports goal achievement and ranking in tournaments. Similarly, social support extended by friends, family and neighbors has a positive impact on the child's mental health and overall performance. The chapter is a pioneer in finding and assessing the impact of emotional, financial and social support on sports management taking into account player preparation.

6.4.3 Practical Significance

The results of the chapter will guide the parents, coaches, sports academies and sports authorities of India on the initiatives and improvement requirements for effectively managing the career of a player. Emotional support has proved to be an important component for improving the mental health, physical preparation and performance of a player. However, studies have shown that there must be an appropriate balance between the involvement and over involvement of parents in the sports of the child (Bonavolontà et al., 2021). Hence, training and education programmes must be conducted for parents to adequately understand the sports and handling of their child. The importance of agility, endurance, flexibility and strengthening must be clearly understood by the parents for effective support and monitoring of the child's training programmes.

Financial support has come out to be the most significant variable for player preparation. The finances of a player must be effectively managed by parents, sports academies and sports authorities. It has been found that sports authorities must provide support to meritorious players from the initial level of their careers. New schemes and policies must be devised by the government's national organizations for providing significant financial support to the potential player at the initial stages of training, nutrition management, and attending tournaments. The results show that with effective player preparation as MV, emotional and social support is not directly related to sports management. Thus, if mental pressure is reduced, performance increases and skill development improves with these constructs then only will have a significant relation with tournament performance, tournament winning, and player goal achievements.

Society, family, friends and neighbors, must also understand the importance of sports and encourage the players on small achievements and pursue sports as a career. This can be done by conducting awareness programmes and explaining the importance of even winning small tournaments for players.

This chapter provides guidance to coaches and sports authorities for improving the schemes and processes for sports management in the country. The chapter has a few limitations such as the results may not be generalized to Western countries. The work does not take into account the bidirectional effects between parents and children. The player's emotions, behaviour, expectations and beliefs may be studied in the future to completely assess the parental involvement. Further, there may be bias in the results considering the educational levels of parents.

Chapter 7

Player's Orientation for Sports Management

The benefits of sports for a player are psychological development, health management, overall development and knowledge about nutrition (Warburton and Bredin, 2017)(Malm et al., 2019). An effective lifestyle of an individual implies following a routine and formation of habits (Arlinghaus and Johnston, 2019). The daily routine of the player can be evaluated by planning of daily schedule for on-field activities, planning of daily schedule for off-field activities and planning of daily schedule for academics.

The formal education of sports is a disciplinary process teaching systematic methodology and rules that correct wrong habits in sports and behavioral domains (Beatrice and Veronica, 2015). Education about selected sports, ethical education, and formal education degrees enhance the player preparation process (Beatrice and Veronica, 2015). For achieving success in sports high training volumes are required at an early age. The level of practice of a player can be enhanced by strengthening-based training programs, training time, adequate tournament exposure, maintenance of nutrition supplements and effective diet plans. The level of motivation can be assessed by coach relationship, coach motivation, sports psychology and player development. These

parameters will influence the process of player preparation and will positively impact the effectiveness of sports management. Player preparation involves overall development and improving the time management, skill development and decision-making capability of a player.

Sports management can be measured by athletic goals achievement, ranking in tournaments, opportunities to compete at championships and effective government policies. The impact of player orientation (measured in terms of daily routine, education, level of motivation, and level of practice) on sports management is significant. Keeping in view the above factors, a questionnaire is designed to gather feedback from Badminton players with an aim to enhance the process of player preparation and sports management in India. Badminton sports require maintenance of speed, balance, posture, coordination reaction, endurance and technical skill (Manrique and Gonzalez-Badillo, 2003; Mor et al., 2023b; Pamungkas et al., 2022; Ratamess, 2011). The questionnaire was filled out by 754 Badminton players across various states in India. The mediation effect of player preparation between daily routine, education, level of motivation, level of practice and sports management is analysed using the PLS-SEM approach.

The study analyses the problems faced by players after the training sessions, the effectiveness of government funding and schemes, the requirement of specialist trainers and future plans of players from the player's perspective. The RQ_{4a}-RQ_{4g} stated in section 3.1.4.4 are addressed in this work.

To the best of the author's knowledge, this work is the pioneer and the main contributions of this study are: 1) Assessment of the mediation effect of player preparation between daily routine, education, level of motivation, level of practice and sports management. 2) identification of problems faced by the players post-training sessions 3) government financial support to the players from the player's perspective 4) major factors of support in the athletic career of players 5) post-athletic plans of players after retirement 6) development of the framework for sports management in India.

The chapter presents the proposed framework for improving the performance of India

in Badminton Sports keeping in view the recommendations gathered from coaches, parents and players.

The chapter is organized as follows: Section 7.1 summarizes the player questionnaire and demographics of respondents. Section 7.2 presents the validity assessment results. The results and answers to the RQs are presented in section 7.3. Section 7.4 presents the proposed framework for sports management. Section 7.5 provides the summary of results, theoretical and practical significance of the chapter.

7.1 Research Background

A questionnaire was designed consisting of 6 constructs, 4 IV, one MV and one DV. In the below sections, constructs and indicators in the questionnaire are described.

7.1.1 Variables Used

The four IVs were daily routine, education, level of motivation and level of practice and exercise. The planning of daily onfield, academics, training and fitness schedule was part of the daily routine construct. The questions on formal, sports and moral education were part of the questionnaire (Aquilina, 2013). The level of motivation is important for the players. The relationship and involvement of the coach will lead to player development. The next construct, level of practice, includes adequate training, exposure to national and international platforms, strengthening-based training and maintenance of appropriate nutrition and supplements.

Player orientation towards sports has a significant impact on sports management with the mediating effect of player preparation. The player preparation construct is measured in terms of satisfaction level of skill development, time management and performance and overall development (Matyas, 2013). Sports management had questions based on athletic goals achievement, ranking in tournaments, opportunities to compete at championships and policies and initiatives by the governance.

7.1.2 Questionnaire Content Validation

As described in section 3.2.2, the questionnaire was shared with two renowned players and two professors electronically for content validation, feedback and suggestions. All the suggestions proposed were well incorporated into the questionnaire.

7.1.3 Player Questionnaire

A Google form was created and the questionnaire was sent electronically to Badminton players and the responses were collected from 15 May 2023 to 7 June 2023. The questionnaire was shared with Badminton players who participated at atleast zonal level. The respondents were requested to give their best judgment about the organizational reality on a Likert 5-point scale as stated in section 3.2.1. Table 7.1 presents the questionnaire with respect to four IV (daily routine, education, level of motivation, level of practice and exercise), one MV (player preparation) and one DV (sports management).

Table 7.1: Questionnaire Content

Construct	Indicator	Description
Daily Routine (D)	D1	You plan your daily schedule for onfield activities
	D2	You plan your daily schedule for academics
	D3	Your daily coaching schedule is fixed
	D4	Your daily fitness schedule is fixed
Education (E)	E1	In your opinion, the formal sports qualification adds to your success in games at national and international level
	E2	The choice of sports career bring excitement and you really feel involved in the activity
	E3	Adequate education is provided to you on the specific sports of your choice
	E4	Moral and ethical education is part of your training programme

Level of Motivation (M)	M1	Your sleep pattern is satisfying and relaxing
	M2	The relationship with the coach is good
	M3	You are involved in the decision-making of the sports
	M4	Coach encourages you to ask questions
	M5	Coach answers the questions carefully and completely
	M6	Coach is friendly and motivating
Level of Practice and Exercise (P)	P1	Adequate training is provided in the specific sports
	P2	Adequate exposure to various international and national platforms is provided to you
	P3	The training time per day is sufficient
	P4	The strengthening-based training programme is effective
	P5	Your maintenance of nutrition supplement is appropriate
	P6	The nutrition plan is effective
Player Preparation (PP)	PP1	You are satisfied with your time management
	PP2	You are satisfied with your overall development
	PP3	You are satisfied by your skill development
	PP4	Your decision making capability is adequate
	PP5	You are satisfied by your performance
	PP6	You are satisfied with the coaching centre/academy
Sports Management (SM)	SM1	You get recognized by the government after winning tournaments
	SM2	You getting good opportunities to compete at national championships
	SM3	You are satisfied with the fulfillment of your goal achievement
	SM4	You achieve high ranking in sports events
	SM5	You are satisfied by the financial schemes by the government

7.1.4 Questionnaire Participants Details

Table 7.2 provides the summary of demographic information of the respondents of the questionnaire in terms of gender, age, education level, experience in sports playing and level of participation (zonal, state, national, international). A total of 754 players across various states in India filled out the Google form. Out of the total respondents, there were 63.13% male players and 36.87% female players. 65.52% of the respondents were of age less than 20 years. 68.7% respondents had 0-5 years of playing experience. 50.40% of participants played at the zonal level, 27.32% of participants played at the state level, 18.57% of participants played at the national level and 3.71% of participants played at the international level.

Table 7.2: Demographic Information of the Respondents

Factor	**Value**	**Number of Responses**	**% of Responses**
Gender	Male	476	63.13%
	Female	278	36.87%
Age	less than 20 years	494	65.52%
	between 20 to 30 years	238	31.56%
	31 and above	22	2.92%
Educational level	Below 10th	44	5.84%
	10th	74	9.81%
	12th	192	25.46%
	UG	400	53.05%
	PG	44	5.84%
Sports playing experience (in years)	0-5	518	68.70%
	6-10	170	22.55%
	11-15	28	3.71%
	Above 15	38	5.04%
Level of participation	Zonal	380	50.40%
	State	206	27.32%
	National	140	18.57%
	International	28	3.71%

7.1.5 Hypothesis Testing

The hypothesis of the research is formed considering the mediation effect of player preparation on IV and DV in section 3.1.4.4 (H_{6a}-H_{6l}). The mediation effect of player preparation on daily routine, education, level of motivation, and level of practice on sports management is found in the work. The impact of each IV on MV and DV at a 0.05 significance level is analysed. The research questions are answered and discussed in the subsequent sections.

7.2 Validation Assessment Results

The PLS-SEM analysis (Cepeda-Carrion et al., 2018; Chin et al., 2003; Leguina, 2015; Wong, 2013) is used for the development and validation of the proposed path model as detailed in section 3.1.6.4. A two-step process is used in the PLS-SEM approach (Panigrahi et al., 2023). First is the measurement model and second is the structural model. Section 3.3 presents the theoretical details of measurement and structural model. The measurement model is verified for reliability and validity using indicator relevancy, internal consistency reliability, convergent validity and discriminant validity. The threshold values of measures used for measurement and structural models are presented in section 3.3. Table 7.3 presents the factor loadings and indicator reliability. The factor loadings are greater than 0.5 and the indicator reliability (measured as the square of factor loadings) of all the items is more than 0.4 (Hair et al., 2019).

Table 7.4 presents the results of the reliability and validity of constructs. The values of Cronbach alpha are greater than 0.7 between 0.804 to 0.896 and AVE are greater than 0.5 between 0.622 to 0.716. (Bagozzi and Yi, 1988)(Sarstedt et al., 2021). The composite reliability of all the constructs is also above 0.7. Table 7.5 shows the discriminant validity of constructs and values of the square root of AVE are greater for all the constructs as compared to correlations between other constructs (Fornell

Table 7.3: Factor Loadings of Indicators

Construct	Indicator	Loadings	Indicator Reliability
Daily Routine	D1	0.784	0.615
	D2	0.827	0.684
	D3	0.879	0.773
	D4	0.892	0.796
Education	E1	0.825	0.681
	E2	0.675	0.456
	E3	0.842	0.709
	E4	0.817	0.668
Level of Motivation	M1	0.842	0.709
	M2	0.817	0.668
	M3	0.789	0.623
	M4	0.796	0.634
	M5	0.825	0.681
	M6	0.675	0.456
Level of Practice and Exercise	P1	0.697	0.486
	P2	0.771	0.595
	P3	0.738	0.545
	P4	0.804	0.647
	P5	0.884	0.782
	P6	0.846	0.716
Player Preparation	PP1	0.690	0.477
	PP2	0.872	0.761
	PP3	0.900	0.81
	PP4	0.777	0.604
	PP5	0.837	0.701
Sports Management	SM1	0.740	0.548
	SM2	0.780	0.609
	SM3	0.806	0.650
	SM4	0.813	0.661
	SM5	0.804	0.647

and Larcker, 1981; Hair et al., 2021). Thus, reliability and validity checks are passed by all the constructs.

After testing the measurement model, the structural model is tested. The multi-collinearity values were found to be less than 5. The bootstrapping method is used to check the relationship between constructs and test the hypothesis at a 0.05 significance level.

Table 7.4: Reliability Analysis of Constructs

Construct	Cronbach's Alpha	Composite Reliability	AVE
D	0.867	0.910	0.716
E	0.804	0.870	0.628
M	0.886	0.915	0.643
P	0.880	0.910	0.628
PP	0.888	0.916	0.646
SM	0.848	0.892	0.622

Table 7.5: Discriminant Validity of Constructs

	D	E	M	P	PP	SM
D	0.846					
E	0.686	0.793				
M	0.788	0.763	0.802			
P	0.736	0.763	0.756	0.792		
PP	0.743	0.632	0.739	0.743	0.804	
SM	0.669	0.574	0.673	0.726	0.781	0.789

7.3 Analysis Results

This section presents the results of the study and the RQ formed in this chapter are answered and discussed.

7.3.1 RQ_{4a}: What is the impact of daily routine, education, motivation and practice & exercise on sports management with the mediation effect of player preparation from the player's perspective?

Tables 7.6, 7.7 and 7.8 show sample mean, standard deviation, t-statistics, level of significance of relationships and confidence intervals. The impact of education, motivation, practice & exercise, and daily routine on sports management and player preparation without using the mediation analysis is shown in table 7.6. The results show that education (E) is not related to player preparation and sports management.

Hence, the H_{6b} and H_{6f} hypotheses are rejected and there is no impact of education on player preparation and sports management. All the other constructs namely daily routine, level of motivation and level of practice are found to be related to both player preparation and sports management. Hence, hypothesis H_{6a}, H_{6c}, H_{6d}, H_{6e}, H_{6g}, H_{6h} are accepted. The coefficient of the level of practice and exercise (0.356 for player preparation and 0.496 for sports management) is greatest compared to the other constructs indicating that it has the strongest relation with sports management. Hence, adequate training, adequate participation in tournaments, a strengthening-based training programme, proper nutritional management and an effective nutrition plan (De Sousa et al., 2022) will have a positive impact on the sports management of the players.

Table 7.7 presents the results of the direct analysis with mediation analysis, including player preparation as an MV. Daily routine and level of motivation do not have a direct effect on sports management whereas education does not have a direct effect on player preparation and sports management. If the direct impact of IV on DV becomes insignificant with the introduction of MV then there is full mediation between IV and DV otherwise the mediation effect is partial. Thus, daily routine and level of motivation have a full mediation effect on sports management as shown in table 7.8. Level of practice and exercise have a partial mediation effect on sports management.

Table 7.6: Results without Mediation Analysis

Relationship	**Original Sample**	**Sample Mean**	**Std. Dev.**	**T Statistics**	**P Values**	**2.50%**	**97.50%**
D -> SM	0.209	0.209	0.071	2.943	0.003	0.071	0.350
E -> SM	-0.114	-0.114	0.070	1.624	0.105	-0.259	0.009
M -> SM	0.222	0.227	0.077	2.895	0.004	0.065	0.359
P -> SM	0.496	0.493	0.072	6.907	0.000	0.359	0.642
D -> PP	0.305	0.305	0.069	4.446	0.000	0.177	0.442
E -> PP	-0.059	-0.054	0.062	0.950	0.342	-0.175	0.069
M -> PP	0.274	0.274	0.081	3.375	0.001	0.102	0.417
P -> PP	0.356	0.353	0.060	5.956	0.000	0.238	0.469

The model fitting results are shown in table 7.9. The results show that the value of

Table 7.7: Direct Effect with Mediation Analysis

Relationship	Original Sample	Sample Mean	Std. Dev.	T Statistics	P Values	2.50%	97.50%
D -> PP	0.305	0.309	0.07	4.363	0.000	0.167	0.443
D -> SM	0.062	0.061	0.065	0.951	0.342	-0.063	0.186
E -> PP	-0.057	-0.052	0.065	0.883	0.378	-0.169	0.082
E -> SM	-0.086	-0.092	0.068	1.259	0.208	-0.233	0.033
M -> PP	0.274	0.270	0.080	3.426	0.001	0.112	0.417
M -> SM	0.091	0.099	0.080	1.144	0.253	-0.066	0.257
P -> PP	0.355	0.352	0.063	5.661	0.000	0.226	0.466
P -> SM	0.313	0.311	0.074	4.245	0.000	0.178	0.45
PP -> SM	0.490	0.493	0.056	8.728	0.000	0.384	0.596

Table 7.8: Indirect Effect with Mediation Analysis

Relationship	Original Sample	Sample Mean	Std. Dev.	T Statistics	P Values	2.50%	97.50%
D -> PP -> SM	0.149	0.152	0.038	3.904	0.000	0.086	0.240
E -> PP -> SM	-0.028	-0.026	0.032	0.866	0.387	-0.087	0.040
M -> PP -> SM	0.134	0.133	0.044	3.032	0.003	0.049	0.219
P -> PP -> SM	0.174	0.173	0.035	5.014	0.000	0.108	0.239

R^2 is 0.663 depicting the good explanatory power of the model. The value of Q^2 is also well above zero confirming the predictive power of the model. Table 7.10 presents the results of hypothesis testing. Hypothesis H_{6a}, H_{6c}, H_{6d}, H_{6e}, H_{6g}, H_{6h} are accepted that support the impact of daily routine, level of motivation and level of practice on player preparation and sports management. When taking into account the mediation effect of player preparation, Hypothesis H_{6j} is rejected and H_{6i}, H_{6k} and H_{6l} are accepted. There is a full mediation effect between daily routine, level of motivation and sports management whereas there is a partial mediation effect between level of practice and exercise and sports management.

Table 7.9: Model Fitting Results

Parameter	Value
R^2	0.663
Q^2	0.407
F^2	0.302

Table 7.10: Results of Hypothesis Testing

No.	Hypothesis	Accepted/ Rejected	Mediation Effect
H_{6a}	Daily routine has a positive impact on player preparation	Accepted	-
H_{6b}	Education has a positive impact on player preparation	Rejected	-
H_{6c}	Level of motivation has a positive impact on player preparation	Accepted	-
H_{6d}	Level of practice and exercise has a positive impact on player preparation	Accepted	-
H_{6e}	Daily routine has a positive impact on sports management	Accepted	-
H_{6f}	Education has a positive impact on sports management	Rejected	-
H_{6g}	Level of motivation has a positive impact on sports management	Accepted	-
H_{6h}	Level of practice and exercise has a positive impact on sports management	Accepted	-
H_{6i}	Player preparation has a mediation effect between daily routine and sports management	Accepted	Full Mediation
H_{6j}	Player preparation has a mediation effect between education and sports management	Rejected	-
H_{6k}	Player preparation has a mediation effect between level of motivation and sports management	Accepted	Full Mediation
H_{6l}	Player preparation has a mediation effect between level of practice & exercise and sports management	Accepted	Partial Mediation

7.3.2 RQ_{4b}: What are the problems faced by players after the training sessions and what are their likes and dislikes about coaches?

The major issues reported by the players post-training sessions include body pains, recovery issues, injuries during training, unavailability of psychologists, inappropriate diet plan and lack of proper nutrition, lack of cooldown sessions and body stiffness

(Table 7.11). Hence, well-planned sessions focusing on agility, endurance, strengthening and flexibility of players are required on a regular basis. These sessions will prevent injuries, fasten the recovery after training sessions and reduce body aches and muscle soreness. The sessions will improve the movement, posture, speed, balance and anaerobic capacity, of the player. Relaxation sessions and massages are also important for the recovery process. The government may take appropriate steps for providing nutrition and proper diet to the underprivileged players and nutritionists should prepare well-planned diet charts keeping in mind the daily needs of the player. Further, psychologists must be available for the players to motivate them and provide them with mental health training sessions. The study revealed that 88% of players

Table 7.11: Problems faced by Players after the Training Sessions

Problems faced by players	**Frequency**
Recovery issues	15
Body aches and muscle soreness	16
Fatigue	02
Injury	29
Inappropriate diet plan and lack of proper nutrition	94
Lack of mental training sessions/psychologist	07
Low endurance and strength	02
Lack of cooldown sessions	05
Body stiffness	04

advocated that psychologists should be part of the training programme. Table 7.12 summarizes the likes and dislikes of players about the coach to guide the coaches about maintaining a balance between various factors so that effective future players can be produced. The most frequent likes about coaches from a player's perspective include discipline, supportive behaviour, dedication, coaching skills and time management. The most frequent dislikes, as reported by players, of the coach are aggression, strictness, lack of skills, lack of practical knowledge and biases.

Table 7.12: Likes and Dislikes of Players about the Coach

Likes	#	Dislikes	#
Open for discussion	02	Aggression and temper	16
Discipline	09	No proper training	02
Dedication	07	Lack of motivation	06
Fun during games	01	Lack of attention	30
Coaching skills	10	Lack of practical knowledge	06
Time management skills	06	Biased	05
Mental control	01	Lack of appreciation	03
Attitude on court	02	-	-
Motivation	20	-	-

7.3.3 RQ_{4c}: What are the responsibilities of the coach (agility, endurance, flexibility, strengthening, nutrition plans, relaxation sessions) and in which area separate trainers are required according to the player's perspective?

Figure 7.1 presents the bar chart representing the responsibilities of the coach from the player's perspective. According to players, 76%, 73%, 70%, and 42% of coaches are responsible for agility, endurance, flexibility and strengthening training.

Figure 7.2 presents the bar chart representing the requirement of specialist trainers from the player's perspective. According to players, 72%, 70%, 69%, 59%, 39%, and 30% emphasize the requirement of separate specialists in physiotherapists, nutritionists, psychologists, massage therapists, yoga instructors and general physicians. Thus, it can be seen that coaches are overloaded with the responsibility of agility, endurance, flexibility and strengthening training. The study by Mor, Khera and Maheshwari surveyed 82 Badminton coaches and the coaches believed they were overloaded. Hence, separate specialists for agility, endurance, flexibility and strengthening training, physiotherapists, nutritionists, psychologists, massage therapists, yoga instructors and general physicians must be there for producing efficient players and

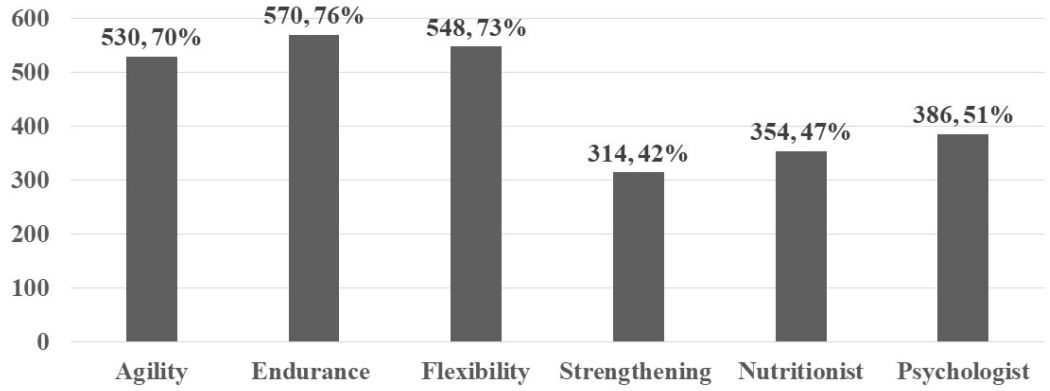


Figure 7.1: Player Perspective regarding the Responsibilities of the Coach

sports management (Mor et al., 2023b).

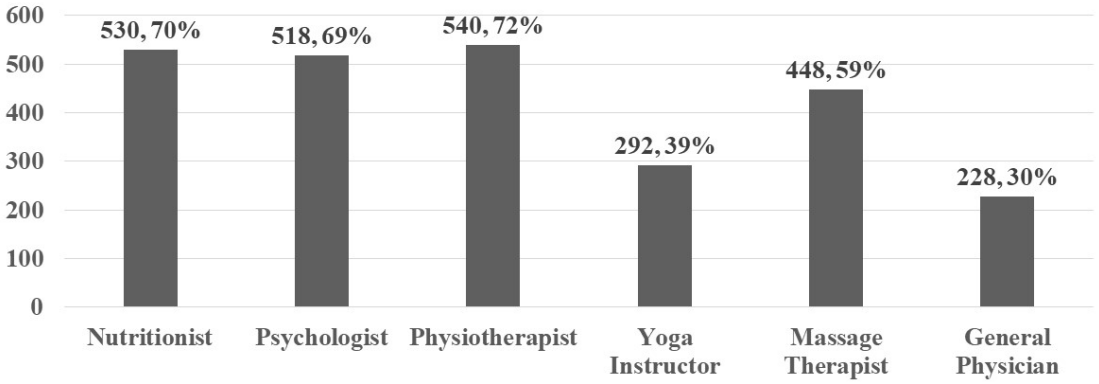


Figure 7.2: Player' Perspective Regarding the Requirement of Separate Specialists

7.3.4 RQ_{4d}: Who is the main factor of support in an athletic career from the player's perspective?

Figure 7.3 presents the percentage of support from various factors in the athletic career of a player. The graph shows that the athletic career of a player is supported 80% by parents, 66% by coach, 32% by government and 31% by friends, according to the player's perception. Thus, parents and coaches are the main driving factors in supporting the athletic careers of players.

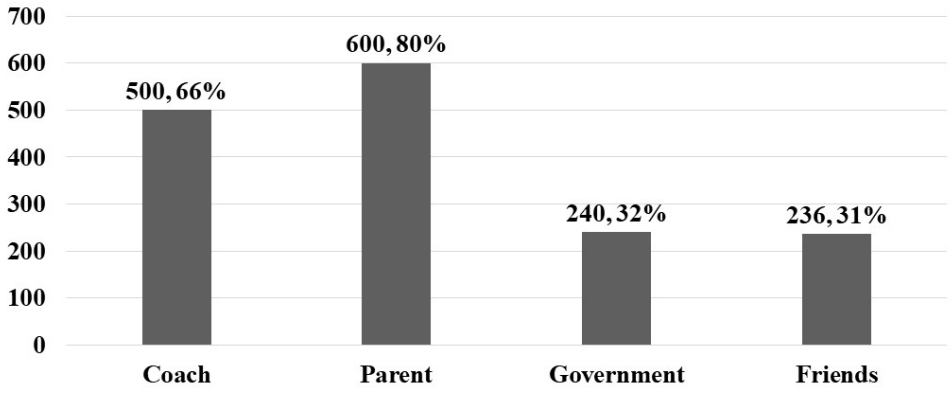


Figure 7.3: Percentage of Support from Various Factors in Athletic Career

7.3.5 RQ_{4e}: What is the satisfaction level of the players with the government schemes?

Figure 7.4 shows the satisfaction level of a player from the government's financial schemes and continuous efforts being made by the governing body of sports management to increase sports effectiveness. The results show that 42% of players either strongly disagree or disagree on being satisfied by the government schemes. However,

52% of players either strongly agree or agree with the continuous efforts being made by the governing body of sports management to increase sports effectiveness. Thus, the government should make an effort to further enhance the financial schemes for the players. Similar results were depicted by capturing parents' perspectives in chapter 6.

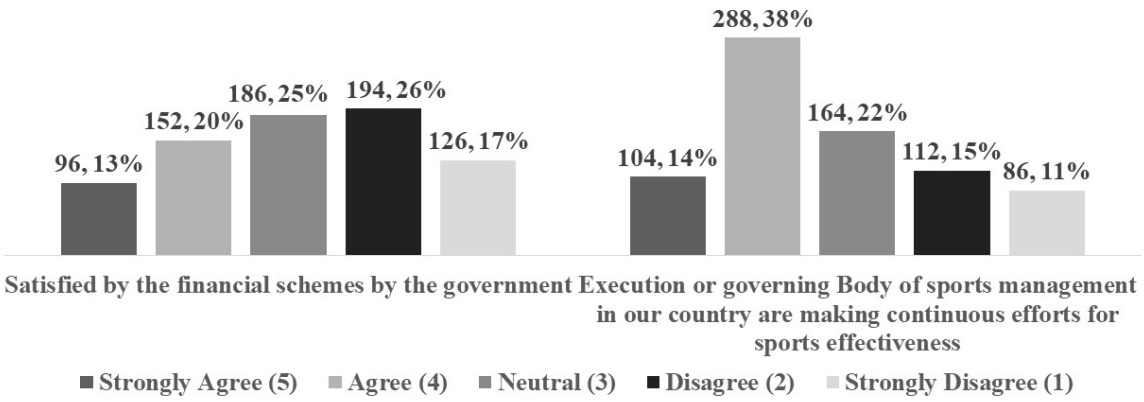


Figure 7.4: Players' Responses on Government Schemes

7.3.6 RQ_{4f}: What are the post-athletic and future plans after sports for the financial stability of players?

Table 7.13 lists the future plans of the player for financial stability or sustainability. The players plan to become coaches, start their own business, get a sports quota job, a government job, or become fitness trainers after their post-athletic career. Further measures may be taken by the government to secure the post-athletic future of meritorious players.

Table 7.13: Future plans after sports for financial stability/sustainability Post athletic plans Frequency

Physical education coach	16
Sports quota jobs	08
Academics or teaching	05
Business	24
Government job	15
Player only	16
Fitness trainer	02
Confused or not yet decided	25
Olympic winner	08
Academy owner	03
Yoga instructor	02

7.4 Proposed Framework for Sports Management

The focus of this study is to design an effective framework for sports management in India. It is seen that educational programmes, proper nutritional guidance, psychological support and motivational programmes can prove to be effective in enhancing the player's orientation towards sports. This section answers one of the prime research questions of the work and thus proposes a framework for improving sports management in India.

7.4.1 RQ_5: What are the recommendations for improving the performance of India in Badminton Sports?

This section answers the RQ_5 stated in section 3.1.4.5. As can be seen from Chapter 2, although the performance of India has improved since the first Olympics there is still a lot of potential and scope for improvement of India in the Olympic games in terms of the medal tally.

This thesis provides a summary of opinions, recommendations, practices and strategies from coaches, parents and players in Badminton sports. These can be taken as guidelines and will help in refining the existing sports management system of India

and other developing countries. In the current state of sports management in India, Indian sports is managed by the Sports Authority of India which has various regional and training centres. The Ministry of Youth and Sports Affairs was set setup in 1982. To promote sports and games, the Sports Authority of India (SAI) has been working under the Department of Sports, Govt. of India. Figure 7.5 shows the organizational structure of the SAI. It can be seen, that various divisions, centres and academies are working under SAI. Despite continuous efforts of the Government of India, India is underperforming in sports and struggling for success in International sports events. Hence, the presence of stringent and efficient centres and divisions with effective implementation and monitoring of strategies is missing. The national sports policy of India also needs to be revised and improvised incorporating the learning from past failures and successes (Clarke and Mondal, 2022).

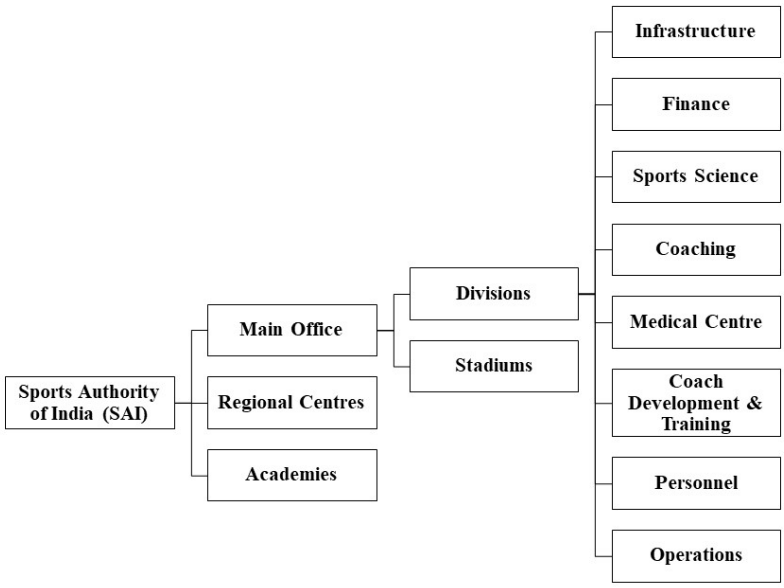


Figure 7.5: Organizational Structure of Sports Authority of India (Source:https://sportsauthorityofindia.nic.in/sai/organisatonal-information)

Table 7.14 shows the year-wise budget allocation for sports in India. The last column of the table shows the percentage of allocation of budget to sports. The percentage

of budget allocation to sports is approximately the same in the last 10 years. In the results of the responses to the questionnaire collected from players, it was seen that 42% of players either strongly disagree or disagree on being satisfied by the government schemes. Similarly, 41% of disagreement on the satisfaction with the financial schemes by the government was seen from the responses to the questionnaire collected from parents of the players. Hence, the increase in the budget and percent allocation of funds to sports and continuous monitoring of the effective spending of finances on the potential players will improve the status of the medal tally in India.

Table 7.14: Budget Allocation for Sports in India (https://factly.in/data-what-has-been-the-budget-allocation-to-sports-over-the-years/)

Year	Budget Allocation (in crore)	Actual Expenditure (in crore)	% of share allocation
2012-13	797.26	657.88	0.06
2013-14	874	809.96	0.06
2014-15	1322.61	766.86	0.09
2015-16	1082.13	1020.65	0.07
2016-17	996	1074.66	0.06
2017-18	1393.21	1229.32	0.07
2018-19	1575.15	1297.38	0.07
2019-20	1600	1989.39	0.07
2020-21	2100.42	1304.12	0.06
2021-22	1906.14	1748.76	0.06

In order to improve the performance of players and improve the medal tally in Olympic games work on the grassroots level is required and several initiatives are required to be taken. Chapters 5 and 6 surveyed coaches and parents of players, in India, and both were of the perception that the Indian sport's governing bodies are making continuous efforts to improve sports effectiveness, however, they were dissatisfied with the financial schemes by the government. Thus, lack of funding for sports is one of the major reasons for the underperformance of players in sports. The other prime reasons include poor infrastructure, lack of effective teams, lack of educative programmes, unavailability of quality coaches, lack of evaluation and monitoring,

lack of proper nutrition, and lack of strategy for winning medals (Polson and Whiteside, 2016). In Chapters 5 and 6, it was emphasized that there is a requirement for specialists for flexibility, endurance, agility and strengthening training of the players. A complete team including a coach, specialist trainers, physiotherapists, nutritionists, sports psychologists, and yoga instructors must work on the players to improve their performance. There must be small and large-scale centers created with a well-defined programme for coach education and producing specialist trainers in flexibility, endurance, agility and strengthening (Bullock et al., 2009; Vaeyens et al., 2009; Zheng and Chen, 2016). The study (Bullock et al., 2009), showed that significant training programmes for players with the best facilities and coaches will improve the medal tally in Olympic games. There are mass initiatives required by the sports authorities and federations of India that include,

- strengthening of sports bodies,
- increase in fund allocation in sports,
- creation of training centers for coaches and specialist trainers,
- preparation of teams with specialist trainers,
- improvement in infrastructure facilities, development of new strategies and policies,
- financial schemes to promote talent and female participation,
- educative programmes for mass awareness of sports for parents and players,
- effective monitoring of the implementation of schemes and strategies,
- post-career support to players and
- regular medical support through check-ups, injury prevention strategies and ensuring mental well-being.

Planning of formation of a team consisting of exercise trainers (flexibility, endurance, agility, strengthening, yoga instructors), sports nutritionists, and sports psychologists, as suggested by the successful model of US (Moreau and Nabhan, 2012) and (Mor et al., 2023b), will be very effective in improving the performance of Indian players. The availability of separate nutritionists so that proper nutrition is provided to the players is also essential for developing countries including India. The results of Chapter 5 (Mor et al., 2023b) also revealed that the coaches felt overloaded with multiple profiles. Keeping in view, the suggested team for player preparation with separate trainers and specialists will be effective in the enhancement of sports management in India.

The focus on physical education and rigorous practice from early childhood is effective in player preparation and planning and winning medals (Güllich, 2014; Güllich et al., 2019; Vernacchia et al., 2000). Thus, emphasis on physical education from the school level (both public and private) must be given by conducting mass awareness programmes on sports and promoting the Olympic games. This effort can be enhanced by creating mass databases and using reliable monitoring tools to measure the extent of participation in sports across the country. There is a gender imbalance in the participation of females in sports (Rani and Sathiyasekaran, 2013). It is seen that there is very little participation of women players in the Olympic games. In study (Zheng and Chen, 2016), one of the strategies of China was to train the females in sports having a lower degree of international competition. Thus, female participation should be enhanced in the Indian Olympic games.

Active parental support is an important factor in the preparation and success of a player (Mor et al., 2023c). The emotional support provided by the parents enhances the performance, reduces mental stress and improves the confidence of a player (Bennie et al., 2021; Gibbons et al., 2003; Gould et al., 2002; Greenleaf et al., 2001; Güllich et al., 2019; Rees et al., 2016; Schinke, 2009; Vernacchia et al., 2000). The financial support in the initial stages in terms of training(Timperio et al., 2013). Thus, mas-

sive awareness programmes must be conducted for parents and children to increase participation and promote the mental wellness of players in sports. The addition of a separate division for team development focusing on player preparation and a sports medicine division will enhance the procedure of player preparation in India (Moreau and Nabhan, 2012). Further, grassroots work must be done for player preparation from early childhood by maintaining a central database of potential players. Considering the perception of coaches, parents and players, figure 7.6 provides a comprehensive framework for sports management in India.

We propose the presence of a separate team working for player preparation consisting of coaches, trainers for agility, flexibility, endurance and strengthening training, physiotherapists, psychologists, nutritionists, massage therapists, yoga instructors and general physicians. The presence of these specialists will provide focused training and guidance to the players and thus significantly improvise their performance in various dimensions by improving technical tactics, physical well-being, mental health and dietary requirements. It will also reduce the risks of injury occurrence. The framework proposed in this study will help coaches, sports academies, sports authorities and other related bodies to improve the process of player preparation and effective management of sports in the nation. The presence of strong financial and other schemes for enhancing sports management in India is also proposed. The conduct of educational training programmes for coaches to enhance and improve their knowledge and skills is also been suggested (Mor et al., 2023b).

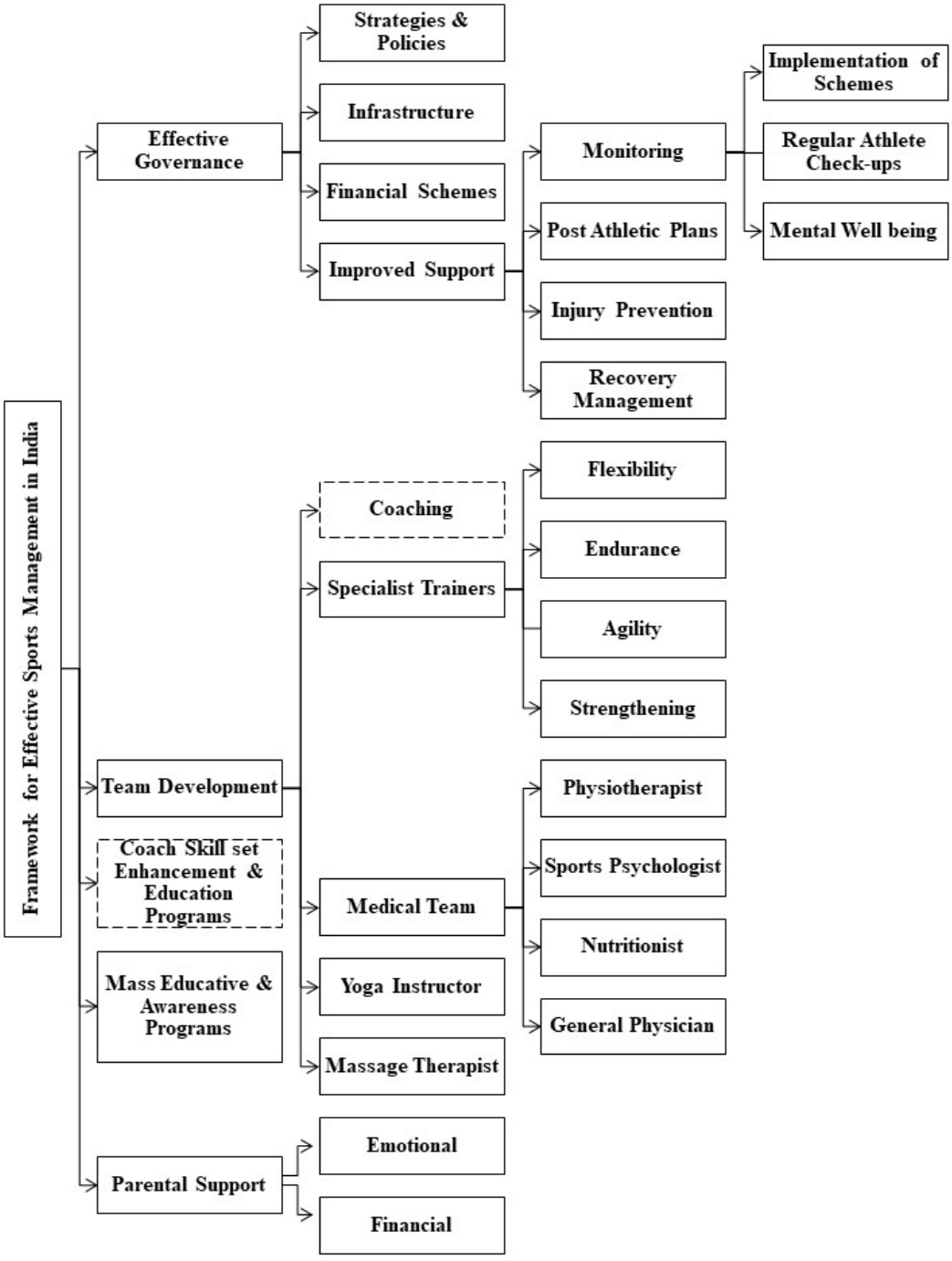


Figure 7.6: Proposed Framework for Effective Sports Management

Further, the number of studies on sports management is very low and hence a greater number of surveys, research and deliberations focusing on deeper insights on

strategies and policies on sports management in India must be carried out.

7.5 Discussion of Results

7.5.1 Summary of Results

In this work, we present the mediation analysis of player preparation between player orientation (daily routine, education, level of motivation, level of practice and exercise) and sports management. The requirement of separate specialists was also asked from the players. The problems faced by the players after the training sessions were also listed. The feedback on government schemes and future plans of the players was also obtained. The questionnaire was filled out by 754 Badminton players and the PLS-SEM approach was used to perform the analysis.The following are the major results of this chapter:

1. The results depict that daily routine, level of motivation, and level of practice have a positive impact on sports management. Education was not found directly or indirectly related to sports management. The results show that player preparation has a mediation effect between daily routine, level of motivation, level of practice and sports management.

2. According to players, the financial government schemes require improvement and special specialists are required as physiotherapists, psychologists, massage therapists, yoga instructors and general physicians.

3. The most often problems faced by the players after the training sessions include body spasms, recovery issues, injuries, unavailability of a psychologist, inappropriate diet plan, lack of proper nutrition, lack of cooldown sessions and body stiffness.

4. The post-athletic plans were also shared by the players including sports quota jobs, government jobs, business opportunities and fitness trainers.

5. The proposed framework can be utilized by the sports authorities and execution bodies in improving the effectiveness of sports management in India.

7.5.2 Theoretical Significance

The study empirically analyses the relationship between player orientation and sports management. In this work, the medicating effect of player preparation on the relationship between player orientation and sports management is also analysed.
The level of practice and exercise was seen as one of the essential constructs for sports management. From the path model analysis, it may be noted that daily routine, level of motivation, and level of practice have a positive effect on sports management. It was hypothesized that player preparation has a mediating effect on player orientation (daily routine, education, level of motivation, level of practice) and sports management. The study provides statistical evidence for the mediating effect of player preparation on daily routine, level of motivation, level of practice and sports management. The study reveals that maintenance of daily routine, motivation of players and regular training sessions have a positive impact on player preparation leading to sports management. The results highlight the need for recovery management, injury management, nutrition management and mental health management. Hence, there are several inferences for sports authorities and coaches from this study.

7.5.3 Practical Significance

The outcomes of this research have direct implications for sports agencies and sports authorities. It helps in identifying the important parameters in player preparation. The coaches can decide on the factors that require focus. The sports authorities can make focused efforts on specific parameters for improving sports management in the nation.

It will help in improving the medal tally of the nation.

The players reported injuries, recovery management, dietary supplements, body aches and muscle soreness, and muscle stiffness as the most frequent problems faced after the training sessions. Thus, the coach must be trained and must prepare well-planned strengthening sessions, and separate physiotherapists, strengthening trainers and nutritionists must be kept for the players. Further, Regular training programmes for coaches must be conducted and the players must be provided with world-class training facilities and training.

The results highlight the need for financial schemes, and the hiring of specialist trainers on agility, flexibility, endurance, and strengthening by the sports authorities. The requirement of separate specialists such as physiotherapists, psychologists, yoga instructors, massage therapists and general physicians is also highlighted. The sessions should focus on agility, flexibility, endurance, strengthening, and relaxation training for reducing injuries and improving the recovery management process. There should be a special focus on the dietary and nutritional management of players.

Few players are sufficiently rewarded financially and even fewer can depend on the measures by the government for their post-athletic career (Aquilina, 2013). Thus, planning of ”dual career” or preparing after retirement for players is important while participating in sports. The results show that most of the players want to pursue sports-related jobs as part of their post-athletic plan. The government must focus on schemes for the future and financial planning for professional players.

Chapter 8

Summary and Conclusion

Sports managers today need a broad knowledge base to understand the various issues facing sports organizations and federations. Effective sports management is the key to improving the performance of the player (Friedman et al., 2004). It not only ensures the smooth management of daily activities, training routines, and dietary requirements but also helps the players with their physical and psychological needs. India is growing in various sports in recent times. This is due to the rise in the number of sports confederations from a broad extent of sports like Badminton, Cricket, Hockey, Boxing, Tennis, Kabbadi, Kho-Kho, Wrestling, Shooting, Archery, Athletics, etc. The development of a sports management framework that encompasses the opinions of coaches, parents and players on one hand and professional management of sports academies and sports federations on the other hand will lead to improvement in player performance increasing the ”medal tally” in sports.

The study was commissioned with a view to develop and design the sports management framework encompassing physical fitness, skill set of coaches, player orientation and parental involvement along with policies for government and sports federations. Hopefully, this would lead to better performance of players at national, regional, commonwealth and Olympic games.

The prevalence of flat feet and knock knees is a result of postural deformity that can

be corrected if taken care of at an early age. If these postural deformities are not dealt with at an early age, they can hamper the quality of life and restrain children from participating in many sports activities. The sample of 1590 children included 888 males and 702 females drawn from two schools. It was found that the prevalence of flat feet and knock knees among primary school children between 6 to 10 years of age. The relationship between demographic factors such as age, gender and weight with flat feet and knock knees among primary school children was analysed. The Chi-square test and univariate logistic regression were used for analysis. The relationship between flat feet and knock knees was also explored. The results showed that gender and weight were associated with flat feet and weight was associated with knock knees. It was also shown that 80% of children with knock knees also had flat feet. It is suggested that screening and assessment of flat feet and knock knees must be conducted periodically for primary school children.

The opinions and perceptions of coaches on matters that are related to skill set, team preparation, training of the athletes and general administration were considered essential. The questionnaire on the skill set of the coach included education, agility, flexibility, endurance and strengthening in player preparation and their relation with effective sports management. The data was collected from 82 coaches in badminton sports across various states of India. The results depicted emphasis on the agility, flexibility, endurance and strength of a player in effective sports management. Based on the obtained results guidelines for enhancing player performance were provided to the sports management authorities.

The opinions and perceptions of parents on matters related to emotional, financial and social support to their children for performing in specific sports were also factored. The analysis of the perception of the parent's opinion on different parameters. Through a structured approach, we have validated the questionnaire focusing on the emotional, financial and social support provided to players and its relation with effective sports management with a mediating role of player preparation. The data was collected

from 314 parents whose children are participating in badminton sports across various states of India. The validation of the responses to the questionnaire was done using reliability analysis. Further, suggestions on having separate specialist trainers for the players have also been obtained from the playerś parents. The results showed that there is a mediating effect of player preparation on the relationship between emotional, financial and social support and effective sports management is significant. Hence, the activities required for player preparation should be enhanced to achieve effective sports management.

In this thesis, we surveyed 754 Badminton players with the aim of gathering their views on the influence of motivational factors, education, daily routine and practice level on player preparation and effective sports management. For this, a questionnaire was designed and validated. Then, the results obtained from the respondents are evaluated. The playerś perspective was considered on the requirement of specialist trainers in various areas and summarised the problems faced by players after the training sessions and their future plans after sports for financial sustainability. The results showed the mediating effect of player preparation on the relationship between the level of motivation, daily routine, level of practice and effective sports management. The often problems faced during the training sessions by players included injury, recovery management, tiredness, muscle spasm and pains. The players also emphasized the requirement of separate trainers (agility, strengthening, endurance and flexibility), physiotherapists, psychologists, yoga instructors and massage therapists.

The remainder chapter is organised as follows: Section 8.1 summarizes the major findings of the thesis. The recommendations of the work are presented in section 8.2 and policy implications are listed in section 8.3. Section 8.4 presents the academic, industrial and societal implications of the work. The limitations of the work and future scope are presented in section 8.5 and 8.6, respectively.

8.1 Findings and Conclusions

The domain of sports management today encompasses various functions such as sports administration and planning, event management, sports negotiations and compliance, sports communication, management of elite athletes, sports academies, facility management, and sports marketing management, etc. The following are the main findings and conclusions of this work:

- The aim of the work was to find the prevalence of flat feet and knock knees among primary school children between 6 to 10 years of age. The work confirms the presence of flat feet and knock knees in three out of every five children and two out of every five children, respectively.

- The results showed that gender and weight are related to the prevalence of flat feet and weight is related to the presence of knock knees in children.

- It has been found that 80% of children with knock knees also had flat feet.

- The focus of the study was on agility, flexibility, endurance and strengthening in player preparation and their relation with sports management. The results showed that more than 90% of coaches emphasized on the presence of specialist trainers for agility, flexibility, endurance and strength. Further, 67% of coaches expressed that they were overloaded with players.

- India is allocating inadequate funds for sports. The analysis of the perception of the parent's opinion on different parameters such as emotional, financial and social support will help to analyze the impact on player performance. The results showed that strong parental support was an essential factor in the preparation and success of a player. The emotional support provided by the parents enhances the performance, reduces mental stress and improves the confidence of a player.

- The results confirmed the mediating effect of player preparation between emotional, financial and social support and sports management.

- The results showed that 41% of parents were not satisfied with the financial schemes of the government and 63% of parents were not satisfied by the financial support being received by the government for the training of their children. The parents suggested improving financial schemes by the government and sports academies. According to players, the financial schemes of the government require improvement.

- The results confirmed that player preparation has a mediation effect between daily routine, level of motivation, level of practice and sports management.

- It was shown that 76%, 73%, 70%, and 42% of coaches are responsible for agility, endurance, flexibility and strengthening training, according to players. They opined that special specialists are required as physiotherapists, psychologists, massage therapists, yoga instructors and general physicians.

- The most often problems faced by the players after the training sessions include body spasms, recovery issues, injuries, unavailability of a psychologist, inappropriate diet plan, lack of proper nutrition, lack of cooldown sessions and body stiffness.

- The post-athletic plans were also shared by the players including sports quota in jobs, government jobs, business and fitness trainers.

- The work suggested that players in India need to be trained with well-designed educational and training programmes. In addition to field training, they should be well aware of the theoretical and practical aspects, including sports education, professional orientation, nutritional awareness, and psychological aspects.

8.2 Recommendations

Keeping in view the findings of the study, the following recommendations are made with the belief of improving the sports management framework in India:

- That educational programmes and screening of children in schools must be carried out for the detection and early cure of flat feet and knock knees amongst school children.
- That specialized coach training programmes should be conducted and specialized trainers in various areas of expertise such as agility, flexibility, endurance, strength and nutrition management should be appointed for enhanced player performance.
- That a massive educational programme should be launched for parents and children that will increase participation and promote the mental wellness of players in sports. Besides zonal, state, interstate and national level sporting events should be organised with a well-published calendar.
- That a complete team consisting of coach, specialist trainers, physiotherapists, nutritionists, sports psychologists, and yoga instructors who must work on the players to improve their performance.

To sum up, framework proposed would hopefully prove to be effective and guide sports academies, sports authorities and other related bodies in reorganizing their affairs with the objective of the country's performance at the Olympics and national level. Further, it will improve the process of player preparation and effective management of sports in the nation. The presence of strong financial and other schemes will further enhance sports management in India.

8.3 Policy Implications

The Sports authorities and federations of India must devise the policies for the following:

- To promote effective governance including financial schemes, improved support for players and better infrastructure support. There must be continuous monitoring of the implementation of schemes and strategies.
- To create small and large-scale centers with a well-defined programme for coach education and training, thus improving the overall performance of the Indian teams in various national and international events.
- To create a separate team that provides training and medical assistance to the players (please refer figure 7.6). The training division will consist of specialist trainers for agility, flexibility, endurance and strengthening training. The medical team will consist of physiotherapists, psychologists, nutritionists, massage therapists, yoga instructors and general physicians. The presence of these specialists will provide focused training and guidance to the players and thus significantly improve their performance in various dimensions by improving technical tactics, physical well-being, mental health and dietary requirements. It will also reduce the risks of injury occurrence.
- To promote talent and female participation by the formation of new schemes and providing incentives that will significantly uplift the participation and performance of players nationwide.
- To provide regular check-ups, injury prevention strategies and ensure the mental well-being of players.
- To provide post-career support to players.

8.4 Implications of the Work

The results of the study will guide the parents, coaches, sports academies and sports authorities of India on the initiatives and improvements required for effectively managing the career of a player. The future implications of this study can be categorized as follows:

1. **Academic Implications**: The study advocates setting of short-term courses for coaches and parents. For this, the government should include this segment of education and training for providing informed knowledge which can provide valuable insights for furthering the research in this arena.

2. **Industrial Implications**: Effective handling of inefficient player performance has become imperative for achieving higher ranking in sports events at the international level. This research focuses on generating some actionable insights for tackling poor player performance. The study becomes more relevant for sports practitioners as it is set in the context of evolving mindsets and attitudes of stakeholders in the sports industry. Further, part of Corporate Social Responsibility (CSR) funds by the sports industry should be spent on events, players and sponsorships.

3. **Social Implications**: Society would gain by heightened economic activity as a result of the organization at state, village and town level sports. Thus, would get fame on account of the sportsmen's performance. Further, the overall health index of the nation would improve with the upgradation of sports infrastructure and an increase in sports activities in the country at school, university and national level.

8.5 Limitations of the Work

The aim of the study was to design and develop a framework for sports management. Although the efforts have been successful, it suffers from the following limitations:

1. Paucity of literature in this context of the relationship between Player orientation, coach skill set, parental involvement variables and sports management along with Player preparation as mediators in India is the prime limitation of the study.

2. Data used is that of Badminton sports only, hence generalization is only possible to the closely related sports since findings and observations are sport-specific.

8.6 Future Scope

The future scope of the work is listed below:

1. This study is built around only Badminton sports because of the high popularity of the sports. Also, badminton is a sport that requires a high level of physical performance and the physical characteristics of the players to be selected are of great importance. However, some lessons have been incorporated for other sports as well. All findings of one sports activity may not necessarily apply to all sports owing to their peculiarities. Studies on different sports may be conducted to analyse the factors and their effects.

2. Yet another area for research may be inter-sport model development to arrive at a generalized model of sports management.

3. More studies must be conducted in the Indian context to validate the suggested framework in this work after it is implemented.

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Brief Profile

Educational Qualifications	
Masters of Physiotherapy (Sports Medicine) Achieved distinction from Adhunik Institute of Education and Research	2008
Bachelor of Physiotherapy (B.P.T.) Achieved first division from Sardar Bhagwan Singh Institute of Biomedical Sciences and Research, Balawala, Dehradun	2000
Bachelors in Science (AISSCE) Graduated with distinction	1996
Experience	
Director at Healthy Aayu Sports Rehabilitation Centre	2014 – Continued
Sports Medicine- cum Physiotherapist, Delhi Technological University	2012 – Continued
Integral part of Indian Senior Badminton Team (Badminton Association of India) Senior Sports Physiotherapist of Indian Senior Badminton Team (Badminton Association of India)	Sep 2012 – Sep 2016
Head of Department (Physio Block), Maharaja Agarsain Hospital	Jun 2008 – Feb 2013
Full time Physiotherapist (Physio Block), Maharaja Agarsain Hospital, Ashok Vihar	Jun 2001 – Jun 2006
Head of Department Apollo Clinic, Azadpur, New Delhi	Mar 2005 – Oct 2006
Achievements	
Players Prepared: Ms P.V. Sindhu (Rio Olympics 2016 Silver Medalist - Badminton) Ms Manika Batra (CWG 2018 Gold Medalist â Table Tennis) Ms Divya Kakran (CWG 2018 Bronze Medalist â Wrestling) Mr Devanshu Shivnani (Cyclist) - 6000 km event (2017) Sports Physiotherapist at Commonwealth Games Delhi (2010)	
Specialization	
Sports medicine, sports management, player preparation and sports injuries	