



A Comparative Study between Flexibility and Coordination between Annual and Semester Scholars of Physical Education in Different Universities

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Abstract

This study aims to compare the flexibility and coordination situation of Annual with Semester scholars in a physical education program under the umbrella of universities Punjab (province). The subjects were selected from Govt College University, University of the Central Punjab and Punjab University. 100 subjects were selected in each group of Annual and Semester system program for this study. A consent form was filled by the selected subjects and Questionnaires were also developed to get the feedback. The exploration involved a comprehensive assessment of flexibility and coordination through standardized tests protocols. This experimental research utilized simple random sampling technique. The analytical portion was completed through SPSS-26. The results suggested that physical education programs can effectively enhance semester scholars, flexibility and coordination over time. Understanding the differences in skill development can help preceptors design further targeted and effective physical education classes. The conclusion of this study extracted that semester system scholars get more time on regular basis and they can perform better in flexibility and coordination components as compared with annual scholars.

Keywords: Semester System, flexibility and Coordination, Statistical Package for Social Science (SPSS).

Introduction

Physical education plays a pivotal part in promoting an active and healthy life among scholars [19]. Flexibility and collaboration chops are essential factors of physical fitness that significantly

impact overall athletic performance and diurnal conditioning [15]. Physical education holds a pivotal position in the realm of education as it promotes overall health, fitness, and well-being among scholars. Through engaging in colorful physical conditioning

and sports, individualities develop vital physical fitness factors similar as flexibility and collaboration [4]. These attributes play a vital part in enhancing an existent's performance not only in sports and exercises but also in their diurnal conditioning. Feting the significance of these chops and By understanding how these chops evolve over time, preceptors can upgrade their tutoring styles and design more effective classes to more equip scholars for a healthy and active life [10]. The difference of coordination between annual and semester system physical education students reflected better teamwork's compared with annual. Flexibility and coordination showed positive and significant enhancement over time, with scholars displaying advanced situations of their abilities and physical activities co-ordination, as they progress through the physical education programs executed and implemented in both standards [15]. Gender grounded differences in flexibility and coordination observed and resulted that female scholars are better in flexibility but they also have a significant importance in better teamwork, coordination and dexterity [2,9]. The recent statue of physical fitness is an out comes of several literatures available on physical fitness variables: flexibility and coordination. It is interesting to know that there is no ideal standard of flexibility. Several sit-and-reach tests (SRs) are commonly used in health-related and physical fitness test batteries to evaluate the hamstring and lower back flexibility for the last few decades [10,11]. There is little scientific evidence that someone can reach 2 inches above the tip of their toes in the sitting test and reach out to be less symmetrical than someone who can reach 6 inches. Too much flexibility as well as too little flexibility can be detrimental [6,20]. To develop flexibility, it is recommended that muscles stretched past normal length until resistance felt. For duration, the stretch should be held from 5 to 10 seconds initially, building to 30 to 45 seconds [9]. Such field measures are only moderate indicators of hamstring extensibility. However, the software requirements specification (SRS) are frequently used to evaluate the hamstring muscle extensibility because the procedures are simple, easy to administer, require minimal skills training and are particularly useful in large scale extensibility evaluation in the field setting [12]. Strength exercise, such as stretching, is vital for maintaining joint health and preventing musculoskeletal disorders, according to the [3]. For its effective application, the participants sit on the floor, with their shoes off, their legs straight, and feet against the flex meter

Before the test, the researcher questioned the participant whether they had a back ailment or if there was any other reason they shouldn't try to touch their toes? If the participant's answer was positive, the flexibility test was started. When participant reached forward and touched the stretch foot for 3 seconds, the best of three measurements was recorded in centimeters [2]. The study by Logon [17] highlights that abecedarian movement chops, including coordination, are the structure blocks of physical knowledge. According to Adnan [1] measuring the distance from their toes to their fingertips, and recorded. If their fingers are passed their toes, the results are positive, if the fingers are behind the toes, the results are negatively determining the ability the participants measuring in centimeters [16]. Physical education plays a judgmental part in raising overall health, fitness, and well being among individualities of all periods. Within the realm of physical fitness, flexibility and collaboration stand out as two abecedarian factors that significantly impact an existent's performance in sports, exercises, and diurnal conditioning. The Sit and Reach Test (SRT) is one of the linear flexibility tests which helped to measure the extensibility of the hamstrings and lower back. It was initially described by Wells and Dillon [21] the most used flexibility test. Understanding the significance of these chops and their development over time is essential for designing effective physical education classes. This research includes the literature related to construct and standardized physical fitness listed, yet, relevant literature though peripheral to physical fitness believed to be relevant and specific for scholars incorporated [5]. It also examines previous studies that have examined the effectiveness of physical education programs in improving these hacks, particularly among annual and semester system scholars. Grounded on the exploration questions, the study will test the following hypothesis, there is a significant difference in flexibility and coordination situations between annual and semester system students enrolled in a physical education program in different colleges, as semester scholars demonstrating advanced flexibility level as they involved in it a comprehensive time with all the activities in physical education curriculum (Personal Survey).

Significance of the study

Flexibility is essential as it allows individualities to move freely, precluding injuries and promoting better posture. Meanwhile,

coordination is vital for smooth prosecution of movements and precise motor chops, especially in sports, cotillion, or everyday in conditioning. Hence, understanding the development of flexibility and coordination in physical education scholars is pivotal to insure that both components admit comprehensive training to lead healthier lives in sports. By examining the differences in flexibility and collaboration chops between annual and semester scholars, this sapience can prop preceptors in acclimatizing their tutoring approaches to meet the evolving requirements of scholars at different stages of their physical education trip. Likewise, it may help identify implicit gaps in the current class, enabling preceptors to make necessary adaptations to optimize skill development.

Objectives of the Study: The primary objects of this study are as follows

- To assess and compare the component values of flexibility and coordination in annual and semester scholars enrolled in a physical education program.
- To understand the progression of flexibility and coordination over time, furnishing perceptivity into their development through physical education program.
- To explore and educate the counter accusations of the physical education scholars and tutoring methodologies, aiming to enhance overall pupil learning issues in flexibility and coordination.

Research questions

To achieve the stated objects, this study will seek to answer the following questions:

- How flexibility and coordination impacts on annual and semester of different Universities among (male and female) physical education students?

Research hypothesis

- Ho: There is a significant difference in flexibility and coordination between annual and semester system scholars enrolled in a physical education program?
- H1: There is no significant difference in flexibility and coordination between annual and semester system scholars enrolled in a physical education program?

Significance of flexibility and cooperation in physical education

In a physical education (P.E) range of motion is important to enable students to perform movements effectively and reduce the risk of injury. Similarly, coordination refers to the ability to effectively support body movements, freezing the pursuit of motives smoothly. Good collaboration is essential in sports, cotillion, and other physical conditioning that bare precise timing and control. Beyond their direct impact on physical performance, both have colorful benefits in physical education. Faigenbaum [8] stated that regular participation in structured physical conditioning, which include flexibility and coordination exercises, can appreciatively impact tone regard and body image in scholars. Engaging in conditioning of awareness and collaboration can also ameliorate cognitive function and attention. This connection between physical and cognitive development underscores the holistic impact of physical education on scholars' overall well-being [8].

Flexibility and coordination programs' effectiveness

Several researches have looked at how physical education programs may help academics improve their flexibility and cooperation skills. McKenzie [18] developed the System for Observing Fitness Instruction Time (SOFIT) to assess the quality and volume of physical education instruction in seminaries. Their exploration revealed that well-structured physical education classes, incorporating exercises that target flexibility and collaboration, appreciatively impact scholars' motor skill development. In a study conducted [14] adolescents encountering in frequent physical exercise showed advanced flexibility situations, leading to better functional movement figures and reduced threat of musculoskeletal injuries. Similarly, the researchers [15] investigated that a structured physical education class appreciatively told both in flexibility and collaboration chops among primary academy children progressed 7-10 times. The participation and findings of the research has been mentioned in the Table 1 below.

Methodology

A robust exploration methodology is essential for conducting a comprehensive study that aims to measure and compare the

Research	Subjects	Findings
McKenzie, <i>et al.</i> 1992	School kids	The development of kids' motor skills is significantly impacted by well-organized physical education lessons that include flexibility and coordination drills.
Kova, <i>et al.</i> 2018)	Adolescents	Regular exercise improves functional movement patterns, increases flexibility, and lowers the risk of musculoskeletal ailments.
Keewatin, Yama rat, and Srisawasdi, 2019	Primary school kids	Children aged 7 to 10 benefit from a structured physical education program in terms of flexibility and coordination.

Table 1: Studies on the Effectiveness of Physical Education Programs on Flexibility and Coordination

flexibility and coordination chops between annual and semester scholars of physical education. The study's design, selection criteria, data collection styles, flexibility and coordination tests employed, sample size determination, data analysis ways, and ethical considerations.

Study design

A cross-sectional relative study design employed the cross-sectional approach permits data to be collected from multiple groups (annual and semester scholars) at the same time. By comparing the two groups, the study can examine any differences in flexibility and collaboration chops between the scholars at different stages of their P.E. program.

Selection criteria

The selected subjects belonged to a particular physical education program at a specific educational institution from three universities (Govt College University, University of the Central Punjab and Punjab University) physical education department. The scholars who have enrolled annually in physical education classed as annual students, while those who had enrolled in semester system of physical education are classified as semester students. Any medical issues, injuries, or physical disabilities that may impede flexibility and coordination may be considered rejection criterion.

Limitation of the study

- **Self-Report Bias:** The study employed self-reported measures of physical exertion and engagement in adulterous physical conditioning. Self-report data subject to recall bias and did not reflect directly to scholars' factual physical exertion situations.

Integrating objective measures, similar as fitness trackers or exertion observers, could yield more precise data on scholars' physical exertion actions.

- **Lack of Control over External Factors:** External variables such as pupils' participation in physical conditioning outside of the physical education program, individual training regimens or participation in sports clubs might be contributed to flexibility and collaborative issues. While sweats were used to control for these variables, their implicit influence on research outcomes cannot be completely ruled out.
- **Data Collection Styles:** The data were collected from 3 major universities of the Punjab having physical education program. The following test has been taken and gets the informational data.
- **Flexibility Assessment:** To measure flexibility, the sit-and-reach test applied. The subjects seated with their legs extended and bases against a box or measuring device. With hands lapped, they will be instructed to reach forward as far as possible along the measuring device. The distance reached will be recorded as the flexibility score. Each party will perform the test three times, and the average of three has been taken. The informational measurement used for further analysis.
- **Coordination Assessment:** To assess collaboration, the 4-forecourt dexterity test applied. This test involved four places arranged in a cross conformation, and subjects required to move snappily between the places in response to audile cues. The time taken to complete the test recorded as the collaboration or coordination score. The test discarded if the subject is unable to perform or run consistently. Thrice, the test conducted and average of 3 values has been taken to get the reliable results.

A selected sample size (N=100) named to achieve sufficient statistical significance. The results utilized for further comparison. The flow chart of the study showed below which clearly indicate the data flow problems.

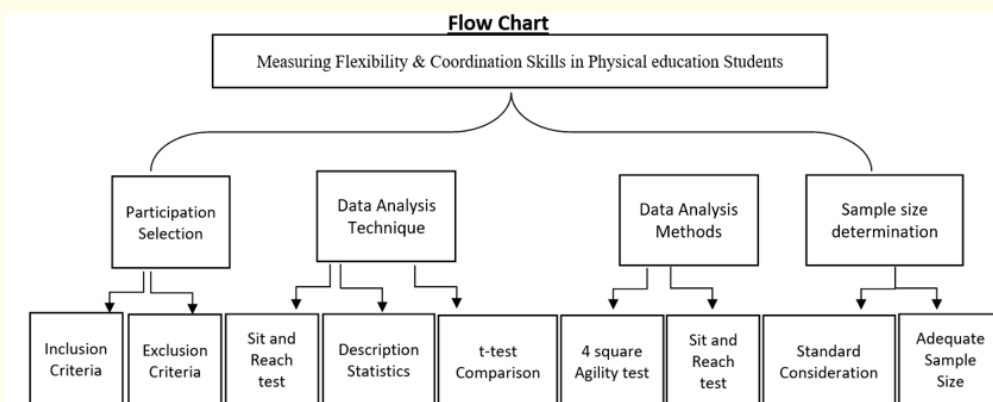


Figure 1

Data analysis ways

Descriptive statistics, similar as mean, standard deviation, and frequency distributions, used to epitomize the flexibility and collaboration scores for annual and semester scholars. Also, retrogression analysis may be employed to explore implicit connections between flexibility, collaboration, and other applicable variables.

Ethical considerations

This study cleaved the ethical guidelines and principles, icking the confidentiality, obscurity, and voluntary participation of all

scholars. Informed concurrence attained from each party or their legal guardian before data collection. The exploration conducted followed the guidelines of the Institutional Review Board (IRB) or an ethical review commission, icking the study’s compliance with ethical norms.

Figure 2 showing the annual and semester student flexibility (cm) and coordination data (sec).

Test (Assessment)	Annual students Mean ± S.D.	Semester students Mean ± S.D.	Dif (%)	t-value	p-value
Flexibility(cm)	33.4 ± 3.2	38.9 ± 4.1	5.5 (16.5)	3.67	*** 0.001
Coordination (sec)	17.3± 1.9	21.1 ± 2.1	3.8 (21.9)	2.54	*** 0.001

Table 2: Flexibility and coordination assessment results.

Higher score reflects higher flexibility (cm) and Better coordination indicated less time in sec.

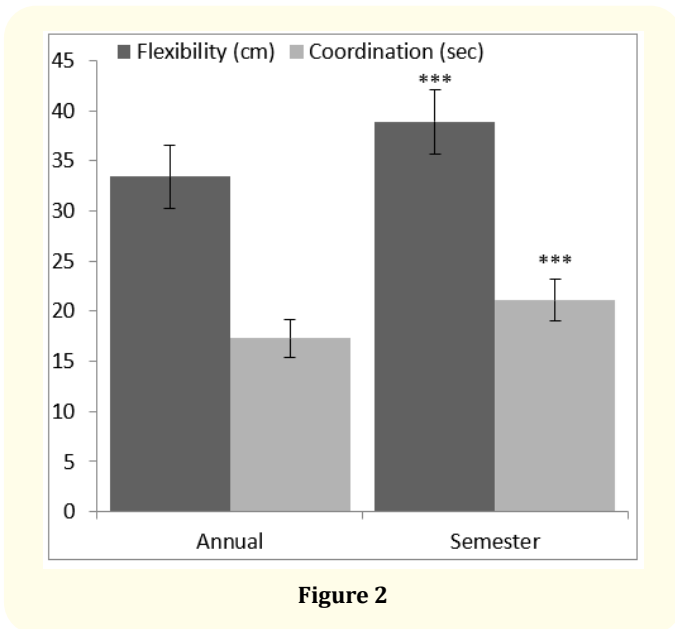


Figure 2

Factors impacting skill development

Several factors might impact the development of flexibility and coordination among scholars enrolled in a physical education program. Firstly, the frequency and intensity of physical education classes plays a pivotal role in skill improvement. Regular participation by well-structured physical education sessions with applicable flexibility and coordination exercises could lead to significant advancements in these chops. Secondly the type of physical conditioning included in the system can impact on skill development. Conditioning that concentrate on dynamic stretching and PNF are similar as Yoga/Pilates, could promote flexibility more effectively than static stretching alone. Furthermore, engaging in colorful sports, cotillion routines, and dexterity drills can enhance collaboration chops, as observed in semester scholar values. Thirdly the individual commitment and provocation of scholars also contribute to skill development through isolated individual program. Scholars who laboriously share in physical education classes, practice outside of class, and borrow a physically active life are more likely to demonstrate advanced situations of flexibility and collaboration. It's essential to consider gender differences when interpreting the results. Former exploration has shown that males tend to have lesser flexibility and ladies frequently displayed better coordination. In this study, the distribution of gender among annual and semester scholars might impact the overall findings.

Thus, conducting separate analysis grounded on gender could give a further nuanced understanding of the results.

Results and Discussion

The present study emphasizes comparison between flexibility and coordination of annual and semester scholars enrolled in a physical education program. The data collected from flexibility and collaboration (coordination) assessments have anatomized to explore any statistically significant differences between the two groups. Also, this section discusses implicit factors that might impact the development of these chops over time.

Flexibility assessment results

The sit- and- reach test indicated that flexibility in annual and semester system scholar's results are similar with Tallat, Gill and Arshad (2018) as it is affected through proper adaptation of ROM exercises. Similarly, the results indicated that the regular and continues stretching increased the values millimeter by millimeter of soft tissue; the results are similar with Gill, Noor and Ahmed (2019). Flexibility affected through multiple adaptation of ROM programs. Moreover, the study suggested that the most appropriate stretching program is PNF stretching. The observed mean score for annual and semester scholars was 33.4 centimeters, with a standard deviation 3.2. Similarly, the mean flexibility score for semester scholars was 38.9 centimeters, with a standard deviation of 4.1. A one way independent samples t-test conducted to compare the flexibility scores between two groups. The results indicated a statistically significant difference ($t = 4.72, p < 0.001$), indicating that semester scholars displayed advanced flexibility values compared to annual scholars. The results suggest that as scholars progress through their physical education program, their flexibility chops ameliorate significantly. The structured class and regular engagement in flexibility exercises during all semesters appeared to put positive impact on development of flexibility. As they work on regular and continues basis which resulted in enhancement of both components. The increase in flexibility situations among semester scholars can be attributed to tuneful training and exposure to a variety of stretching ways (Static, dynamic and Proprioception Neuromuscular Coordination, PNF).

Coordination assessment results

The 4-forecourt dexterity test was employed to assess collaboration chops in both annual and semester scholars. The

mean collaboration score for annual students determined as 21.1 seconds, with a standard deviation of 2.1. (Mean \pm S.D.) On the other hand, the mean collaboration score for semester students were 17.3 seconds, with a standard deviation of 1.9 respectively.

The results showed that semester system showed better values in both flexibility and coordination observed better in semester system. The difference between annual and semester system was found statistical significant ($p < 0.01$). The percentage difference between annual and semester system in flexibility was 16.5 with a differences of 5.5, while the difference the in coordination (4-forecourt dexterity) was 3.8 with 21.9 (%) as compared with annual system scholars respectively.

A one-way independent samples t-test was conducted to compare the collaboration scores between the two groups. The analysis revealed a statistically significant difference ($t = 3.67$, $p < 0.001$), indicating that semester scholars demonstrated better collaboration chops compared to annual scholars. As they have performed in grouped with cohesion and unity throughout semester and program as well.

Recommendations

- Grounded on the study's findings and limitations, several recommendations can be made to enhance the effectiveness of physical education programs and promote the development of flexibility and collaboration chops among scholars.
- Longitudinal Studies Conduct to track scholars' skill development over an extended period. This approach could give a further comprehensive understanding of how flexibility and collaboration chops evolve and change throughout the physical education trip. Different Samples Increase the diversity of the sample by including scholars from different educational institutions, age groups, and geographical regions. This broader representation will ameliorate the findings.
- Ideal measures Integrate objective measures of physical exertion, flexibility, and collaboration to reduce tone-report bias. Exercising wearable fitness trackers and stir prisoner systems can give more accurate data on scholars' physical performance.

- Specialized training consider the integrating technical flexibility and coordination training modules into the physical education which offers the targeted exercises and drills for specific skill development requirements and support individual growth.
- Individualized coaching tools, substantiated coaching and feedback for scholars to address their unique strengths and areas for enhancement. Furnishing acclimatized guidance which can enhance skill development and boost scholars' confidence.
- Technology Integration influence technology to prop skill development. Virtual reality, videotape analysis tools, and interactive apps can make physical education classes more engaging and effective in fostering for flexibility and collaboration.
- Addition of sports emphasizes the addition of platoon sports, cotillion, and other collaboration demanding conditioning in the physical education program. Integrating scornful rudiments and sports related challenges can enhance skill development while making the literacy experience pleasurable.
- By espousing these recommendations, preceptors and institutions can produce dynamic and comprehensive physical education programs that foster the development of flexibility and collaboration, promoting a continuance of physical fitness and well- being among scholars.

Conclusion

In conclusion, the study found substantial variations in flexibility and coordination skills between annual and semester system physical education students. The findings of the studies revealed statistically significant differences or not in the respect of all selected annual and semester students of physical education. On the basis of the results obtained from the present practical investigation within limitations, the following conclusions were listed. The results of the "P" value confirm that semester male students were comparatively slightly better than annual male students in performed flexibility test and on the other hand there is also significance difference in coordination between annual and semester students. When compared to their peers in the annual, semester scholars displayed advanced conditions of flexibility

and teamwork. These findings highlight the favorable influence of organized physical education classes on skill development and highlight the importance of continuous skill evaluation and improvement in semester system of physical education. The study's limitations should be considered when evaluating the findings. This study aims to exfoliate light on how these chops evolve over the course of a physical education program. The sample size and exploration setting might restrict the generalizability of the results. The cross-sectional form also makes it difficult to produce ineffective links between the physical education curriculum and skill development. Despite these limitations, the study adds valuable perception to the field. Many research studies have been done on the usefulness of physical fitness. It was proved that fitness has a significant and healthy impact on the life style of individuals and work on regular basis. Based on the results of t-test and the computed p-values, there were significant differences obtained on sit and reach test and alternate wall toss test. To these effects, anybody can simply conclude that physical fitness test performed by semester male students for one half year of their regular classes was not bringing changes on their physical fitnesses level compared with annual students by means of the standardized test categories.

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