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Impact of Yoga on Selected Physical Fitness Variables among Women NCC Cadets

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Abstract: The objective of this research was to evaluate the effects of a structured yoga regimen on specific physical fitness metrics among female National Cadet Corps (NCC) members. The study prioritized assessing leg explosive power alongside overall flexibility. Forty female NCC cadets, within the age bracket of 18 to 22 years, were recruited from a collegiate setting to serve as subjects. The participant pool was randomly split into two distinct cohorts. An Experimental Group was formed with 20 subjects, while a Control Group comprised the remaining 20 individuals. Over 12 weeks, the Experimental Group engaged in a rigorous and systematic yoga training protocol. Conversely, the Control Group refrained from participating in any specialized training activities during this identical timeframe. To determine the efficacy of the intervention, leg explosive power and flexibility were designated as the primary criterion variables. The assessment of leg explosive power was conducted via the Sargent Vertical Jump Test. Meanwhile, the Sit and Reach Test served as the means to gauge flexibility levels. Upon completion of the training period, the gathered data underwent statistical scrutiny utilizing the t-ratio test. A significance threshold was established at 0.05. The analytical results brought to light a substantial enhancement within the Experimental Group. Improvements showed up clearly across both leg explosive power and flexibility metrics. In stark contrast, the Control Group turned in only marginal variations. These findings point out that consistent yoga practice can prop up the development of selected physical fitness attributes among female NCC cadets. Consequently, regular yoga instruction might stand out as a highly beneficial conditioning strategy for those involved in NCC operations. The evidence underscores that integrating such practices can flesh out the existing physical training modules for these cadets. Implementing these routines holds the potential to build up athletic capacity over time.

Keywords: Yoga, NCC Cadets, Leg Explosive Power, Flexibility.

Introduction.

The Integration of Yogic Practices into NCC Physical Conditioning

Yoga represents a sophisticated, centuries-old Indian framework designed to harmonize physical, mental, and spiritual dimensions. This discipline integrates precise postures, intentional breath regulation, deep relaxation, meditative concentration, and disciplined movement. By fostering a balanced growth of both physiology and psychology, the practice serves as a comprehensive tool for enhancing holistic well-being. Within modern physical education, yoga garners significant interest because specific asanas necessitate exceptional levels of controlled strength, equilibrium, neuromuscular coordination, and articular mobility. Physical conditioning stands as a fundamental pillar for National Cadet Corps (NCC) participants. Standard training protocols encompass a rigorous array of activities, including formal parades, intricate drills, disciplined marching, field maneuvers, leadership development, and high-endurance tasks. Successful execution of these demanding requirements hinges upon superior physical strength, functional mobility, internal discipline, and absolute body control. Specifically, female NCC cadets benefit immensely from adopting a secure, methodical approach to physical conditioning. Yoga offers an ideal solution, as this modality builds physical capacity while mitigating the risk of excessive strain. Consistent engagement in yogic training substantially elevates flexibility, muscular

fortitude, postural stability, equilibrium, and overall physical readiness. Certain asanas effectively stretch major muscle groups, while numerous postures demand sustained muscular contraction. These repetitive actions help hone neuromuscular coordination and sharpen body awareness. Furthermore, controlled breathing techniques bolster concentration levels, allowing for more efficient movement execution. Such attributes prove invaluable for NCC cadets navigating both intense training environments and high-pressure performance scenarios. Leg explosive power remains a critical fitness metric, facilitating efficient jumping, rapid acceleration, seamless drill execution, and the ability to generate force quickly. Simultaneously, optimal flexibility remains essential, as it supports a full range of motion. Enhanced flexibility levels help alleviate muscle stiffness and significantly improve the quality of human movement. Consequently, folding yoga into a standardized fitness regimen can shore up vital physical components, specifically leg explosive power and overall flexibility, ensuring cadets keep up with the rigorous demands of their service.

Statement of the Problem

The primary objective of this research involved evaluating how yoga practice influences specific physical fitness metrics—namely, leg explosive power and flexibility—within a cohort of female NCC cadets. This investigation sought to ascertain if a structured regimen of yoga training brings about significant enhancements in these fitness components when measured against a control group that maintained a standard routine.The study aimed to flesh out the potential benefits of consistent yogic practice on the physiological capabilities of the participants. By setting up a comparison between a dedicated yoga intervention and a baseline control, the researchers looked to tease out whether systematic training could indeed boost athletic performance. The analysis focused on two critical areas: the capacity for explosive leg power and the range of motion related to flexibility. The researchers worked to clear up any ambiguity regarding the efficacy of yoga as a training tool. Efforts were made to point out whether such interventions could lead to measurable improvements in the specified variables. By looking into the data, the study aimed to back up the claim that yoga acts as a viable method for upgrading physical health among women cadets. This inquiry serves to round out the existing literature on sports science by bringing to light the specific physical gains associated with regular yoga adherence.

Need and Significance of the Study

Physical education and NCC training require practical methods that are safe, economical, and easy to organize. Yoga satisfies these requirements. The method can be practiced with limited equipment. The method can also be adjusted according to age, capacity, and training background. Women NCC cadets benefit from training methods that improve mobility and strength together. Yoga includes stretching, static balance, controlled breathing, and muscular engagement. Such features may support better physical readiness. The findings of the study may help physical education teachers, NCC officers, and fitness trainers to include yoga in regular training schedules. The study also contributes to academic understanding in the field of physical education. The investigation provides data on two selected physical fitness variables. The variables are leg explosive power and flexibility. The results may support future research related to yoga, women NCC cadets, and structured fitness programmes.

Objectives of the Study

1. To determine the effect of yoga training on leg explosive power among women NCC cadets.
2. To determine the effect of yoga training on flexibility among women NCC cadets.
3. To compare the pre-test and post-test mean scores of the Experimental Group and the Control Group.
4. To examine the practical value of a 12 weeks yoga training programme for selected physical fitness development.

Hypotheses

1. There will be a significant improvement in leg explosive power due to yoga practice among women NCC cadets.
2. There will be a significant improvement in flexibility due to yoga practice among women NCC cadets.

Methodology

The methodology was meticulously laid out to gauge the impact of yoga interventions on specific physical fitness variables. To ensure rigorous evaluation, the research design incorporated a pre-test and post-test framework. This systematic approach facilitated a comprehensive assessment of the participants before and after the designated training period. Within the scope of this study, the subjects were split into two distinct cohorts: an Experimental Group and a Control Group. The Experimental Group took part in a structured yoga training program. Conversely, the Control Group carried on with their typical daily activities and did not take on any special training sessions. The research team set up this division to tease out the genuine effects of the yoga intervention. By keeping the Control Group away from the new training regimen, the researchers aimed to rule out extraneous factors. This strategy helped the study back up its findings regarding the physiological shifts observed over the course of the experiment. Through the careful comparison of both groups, the data analysis seeks to flesh out the relationship between sustained yoga practice and improvements in physical fitness markers.

Subjects

Forty women NCC cadets aged 18-22 years were selected as subjects. All subjects belonged to a college. The subjects were randomly assigned into two groups. Random allocation helped to maintain group equivalence at the beginning of the investigation.

- Experimental Group (Yoga Training) - 20 subjects
- Control Group - 20 subjects

Variables

The selection of variables adhered strictly to the objectives of this research investigation. The yoga training programme functioned as the primary independent variable. Concurrently, the dependent variables comprised leg explosive power and flexibility. The study design carefully established the yoga training programme as the core intervention, serving as the independent variable. This intervention aimed to drive modifications in the dependent variables. Specifically, assessments focused on evaluating changes in leg explosive power and flexibility throughout the duration of the programme. These metrics were chosen to capture the physical outcomes stemming from the training regimen. Rigorous methodological standards dictated the choice of these parameters. Researchers broke down the study framework to ensure that the yoga training programme acted as the catalyst for development. By tracking leg explosive power and flexibility, the study sought to bring out the physiological benefits inherent in the training. This approach helped in setting up a clear relationship between the intervention and the resulting physical improvements, thereby rounding off the analytical scope of the study.

Independent Variable

- Yoga Training Programme

Dependent Variables

1. Leg Explosive Power
2. Flexibility

Tests Used

The selection of the subsequent standardized assessments aimed to evaluate the designated physical fitness variables. These specific protocols were chosen due to their widespread adoption and established reliability within the fields of sports science and physical education. Rigorous validation ensures these methods align with contemporary research standards, facilitating accurate data collection throughout the study. Every test included in this battery underwent careful screening to confirm its applicability to the research objectives. The established procedures represent industry benchmarks, which helps ensure that the findings remain comparable to existing literature. By sticking to these well-known assessments, the research design builds upon a solid foundation of academic precedent, ensuring that the results carry significant weight. Each measurement tool serves to break down complex physiological performance markers into quantifiable data points. The assessment sequence was laid out to minimize participant fatigue while maximizing the precision of the gathered metrics. Adopting these standardized approaches helps clear up any ambiguity regarding the testing environment and ensures that all protocols hold up under scrutiny. Researchers often look to these specific techniques to carry out comprehensive evaluations in both laboratory and field-based settings, reinforcing the integrity of the overall physical fitness profile.

Variable	**Test**
Leg Explosive Power	Sargent Vertical Jump Test
Flexibility	Sit and Reach Test

Training Programme

The Experimental Group engaged in a comprehensive 12-week yoga training initiative. This structured regimen took place over five days each week, with every session spanning a full 60 minutes. The curriculum incorporated preparatory exercises, specific yogic postures, various breathing techniques, and essential relaxation periods. The training intensity was ramped up in a progressive fashion throughout the duration of the study. This systematic approach ensured that the participants could carry out all movements in a secure and consistent manner. By breaking down the session structure, the researchers allowed the subjects to build up their proficiency over time while they kept up with the demands of the program. The entire framework was set up to make sure that the training load was scaled carefully. Every element of the practice was put together to help the subjects get the most out of each session. This methodical design enabled the group to take on the physical requirements of the curriculum without compromising on safety or quality. The overall consistency of the sessions played a key role in helping the subjects work through the different stages of the program with confidence. The yoga practices were selected to improve mobility, muscular control, balance, and coordination. Postures involving forward bending, backward extension, standing balance, and controlled stretching were emphasized. Breathing practices were included to support concentration and regulated effort. Relaxation was provided at the end of sessions to reduce fatigue and promote recovery.

The control group adhered to their standard daily routines throughout the twelve-week duration. During this interval, no specialized training protocols were implemented for these participants. This research design effectively facilitated a clear comparison between the outcomes of the dedicated yoga intervention and the influence of customary everyday activities. Maintaining this baseline allowed for a rigorous examination of the experimental results. By keeping the control group engaged only in their usual habits, the study ensured that any observed physiological or psychological shifts in the intervention group could be attributed specifically to the yoga practice. Consequently, the research framework stands on a firm foundation that helps tease out the genuine impact of the training regimen while ruling out the noise of uncontrolled variables. This systematic

approach bolsters the credibility of the findings and smooths out potential biases inherent in such comparative studies.

Statistical Technique

The statistical analysis utilized both independent and paired t-tests to evaluate the gathered data. A significance threshold of 0.05 was established for all computations. This rigorous methodology served to ascertain whether variations observed between pre-test and post-test assessments reached statistical significance within the specific cohorts. Furthermore, these tests were employed to determine if the discrepancies identified between the various groups held genuine academic weight. To ensure a thorough investigation, the research design relied upon these specific statistical procedures to pin down the impact of the interventions. By applying the paired t-test, the analysis dug into the internal shifts experienced by participants from the onset of the study through to its conclusion. Simultaneously, the independent t-test was brought in to stack up the performance of the different groups against one another. This dual approach allowed for a comprehensive look at the findings, ensuring that the results were not merely down to chance. The fixed level of significance, set at 0.05, acted as a safeguard to rule out outliers and maintain high standards of validity throughout the research. Every aspect of the data processing was carried out to flesh out the nuances of the pre-test to post-test transitions. Ultimately, this statistical framework was essential to spell out the significance of the findings, thereby setting the stage for a deeper interpretation of the study's outcomes.

Results and Discussion

Two distinct tables summarize the research findings. Table 1 outlines the comparative analysis regarding the pre-test and post-test mean scores concerning leg explosive power. Simultaneously, Table 2 details the comparison involving the pre-test and post-test mean scores associated with flexibility. The subsequent discussion section seeks to tease out the significance of these acquired values, specifically through the lens of the implemented yoga training programme. The data presented in Table 1 highlight the shifts in leg explosive power metrics following the intervention. By setting the pre-test figures against the post-test results, the study brings to light the efficacy of the physical training regimen. These values point toward a notable improvement, indicating that the yoga sessions helped build up the participants' explosive capabilities. Researchers must look into these figures carefully to grasp how the training routine carried out its intended effects on the subjects. Regarding Table 2, the information centers on the fluctuations observed in participant flexibility levels. A thorough examination of the pre-test and post-test mean scores reveals how the yoga programme factored into physical adaptability. The findings suggest that the exercises acted to ease stiff muscles and foster greater range of motion. Consequently, the discussion aims to flesh out the connection between these statistical outcomes and the specific yoga techniques utilized throughout the study. Ultimately, interpreting these quantitative results requires a balanced view of how the yoga training programme played out over time. It is vital to break down the meaning behind the obtained values to determine whether the intervention lived up to the research hypotheses. By evaluating the data in this manner, the study provides a robust basis for concluding how consistent yoga practice contributes to enhancing athletic performance parameters like leg explosive power and overall flexibility.

Table 1 Comparison of Pre and Post-Test Mean Scores of Leg Explosive Power Leg Explosive Power (Sargent Jump Test)

Group	Pre-test Mean	Post-test Mean	Mean Difference	t-ratio
Experimental (n=20)	32.45 cm	38.70 cm	6.25 cm	5.84*
Control (n=20)	32.10 cm	32.65 cm	0.55 cm	0.78

*Significant at 0.05 level.

The Experimental Group demonstrated a substantial increase in leg explosive power after the yoga training programme. The pre-test mean was 32.45 cm. The post-test mean increased to 38.70 cm. The mean difference was 6.25 cm. The obtained t-ratio was 5.84*. The value was significant at the 0.05 level. The Control Group showed only a small change. The pre-test mean was 32.10 cm. The post-test mean was 32.65 cm. The mean difference was 0.55 cm. The obtained t-ratio was 0.78. The change was not significant. These results indicate that yoga training produced a positive effect on leg explosive power among women NCC cadets.

Table 2 Comparison of Pre and Post-Test Mean Scores of Flexibility Flexibility (Sit and Reach Test)

Group	Pre-test Mean	Post-test Mean	Mean Difference	t-ratio
Experimental (n=20)	21.35 cm	27.80 cm	6.45 cm	6.27*
Control (n=20)	21.10 cm	21.75 cm	0.65 cm	0.92

*Significant at 0.05 level.

The research findings highlight a substantial enhancement in flexibility among women NCC cadets following a dedicated yoga intervention. The data indicates that the Experimental Group displayed a pre-test mean of 21.35 cm, which climbed to a post-test mean of 27.80 cm. This performance shift resulted in a mean difference of 6.45 cm. Statistical analysis yielded a t-ratio of 6.27*, confirming that the improvement reached significance at the 0.05 level. These figures point toward the success of the physical training regimen in boosting overall range of motion. In contrast, the Control Group failed to mirror these gains. This cohort started with a pre-test mean of 21.10 cm and reached a post-test mean of 21.75 cm. Consequently, the mean difference stood at a marginal 0.65 cm. The computed t-ratio of 0.92 fell short of the required threshold, rendering the result statistically non-significant. This outcome underscores the lack of improvement in the absence of the specific yoga protocols. Overall, the investigation brings out the clear positive impact that consistent yoga practice exerts on physical suppleness. The data backs up the claim that such exercises build up flexibility levels over time. By weighing up the results of both groups, it becomes evident that the yoga intervention carries out a vital role in physical development. The study does away with any doubt regarding the efficacy of these techniques for the target demographic, as the evidence sets out a strong case for the adoption of yoga to tone up bodily flexibility.

Discussion

The notable enhancements in leg explosive power appear to stem from optimized neuromuscular synergy and increased muscular force cultivated via yoga-based engagement. Various standing postures and deliberate physical transitions necessitate that the lower extremities bear the body's mass. Such activities tend to bolster stability and refine force regulation. Improved inter-muscular coordination likely enables participants to execute movements with greater efficiency during the Sargent Vertical Jump Test. Consequently, the physiological

adaptations achieved through these sessions translate into a more potent explosive output. Regarding flexibility, the observed gains result from the integration of consistent stretching and comprehensive range-of-motion drills. Numerous asanas demand a gradual lengthening of muscular tissue and precise articulation around various joints. Persistent practice effectively eases muscular tension and alleviates tightness. Furthermore, superior joint mobility facilitates a greater reach during the Sit and Reach Test. This is evidenced by the advancement from 21.35 cm to 27.80 cm within the Experimental Group, which underscores the efficacy of this regimen in promoting physical suppleness. Conversely, the Control Group failed to register significant progress in either metric. Minimal fluctuations noted within this cohort likely grew out of routine daily exertion or increased familiarity with the testing protocols. Nevertheless, these adjustments did not reach a level of statistical significance. The clear disparity between the Experimental Group and the Control Group indicates that the dedicated yoga training programme accounted for the primary surge in performance. These results align with existing scholarship suggesting that yoga acts as a catalyst for the cultivation of physical fitness. The practice proves particularly advantageous for women NCC cadets, as it builds essential attributes such as raw strength, mobility, balance, mental focus, and discipline. Moreover, the approach carries high practical utility, as sessions can be seamlessly fitted into an institutional fitness timetable. This methodology stands out as a viable tool for enhancing overall athletic capabilities and physical readiness in a structured environment.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

- Yoga training significantly improved leg explosive power among women NCC cadets.
- Yoga training significantly improved flexibility among women NCC cadets.
- The Control Group did not show significant improvement in either variable.
- Yoga may be recommended as an effective fitness programme for NCC cadets.
- A structured 12 weeks yoga training programme may be useful for improving selected physical fitness variables.
- Regular yoga practice may be included as a supportive training method in NCC physical fitness schedules.

Recommendations

1. Yoga training may be included in the regular fitness programme of women NCC cadets.

2. Physical education teachers and NCC officers may use yoga as a supplementary method for improving flexibility and lower-limb performance.

3. Further studies may be conducted with a larger sample size and additional physical fitness variables.

4. Future research may compare yoga with other training methods such as circuit training, calisthenics, and plyometric training.

5. Similar research may be conducted among male NCC cadets and cadets from different age groups.

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