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RESEARCH ARTICLE

THE SWISS BALL CHAIR

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ABSTRACT

Flat benches or chairs used in offices and schools are very tedious to sit on for long hours. It weakens the spine and hence brings variation on our posture that can cause muscle weakness or back pains in future. Whereas swiss ball helps to maintain our posture better and due to frequent change in positions it reduces damage caused by prolonged sitting in one position. Sitting on unstable surface all day improves sense of balance, as well as reaction of muscles; it also strengthens our abdominal muscles. Investigations proved that it improves posture, balance and concentration. But sitting on swiss ball whole day would have again been difficult; hence swiss ball chair was invented for stable support that can be used professionally for better ergonomics. **Methodology:** The swiss ball chair was designed which was made up of steel and the seat was molded in a way to fit in swiss ball and give a low back support. It had got wheels for mobilization if needed and stoppers for stability. A swiss ball was fitted in the seat. **Result:** Compared to flat bench it was observed that the altered Forward neck position was seen in less than 55% of the subjects, Kyphosis in less than 50%, Lordosis: was normal in 100% of the subjects, Anterior pelvic tilt was absent in 100%, Pelvic obliquity was absent 100%. 100% subjects felt that the concentration increased & 90% of the subjects felt that it was more comfortable in long turn. All the findings are concluded according to patient's response.

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INTRODUCTION

Furniture plays a vital part in the environment and learning experience/process. It is as important as equipment, buildings, and other learning resources. Proper implementation of classroom ergonomics is needed for the maintenance of good health, improvement in academic performance, learning, and motivation. The classroom is similar to other work environments because there is interplay of both "static work" and "force." Static work refers to the musculoskeletal exertion required to maintain or hold a certain position. For example, sitting, and keeping the head and torso upright requires static work; while force refers to the amount of tension generated in the muscles in order to move or keep the body in a particular posture. Hence, the ergonomic requirements for educational chairs are the same as for work chairs. Improperly designed furniture, ill-fitted to the characteristics of a student can result in faster fatigue, defective posture, and the establishment of pathological states which could affect their performance in focusing in class¹.

A comfortable classroom environment improves the efficiency of students by encouraging and motivating them to perform better. Students spend a major time on the chair and desk during college hours, Hence it is necessary that the college furniture should fit the requirements of the students. Therefore, the college furniture should be made on the basis of anthropometric dimensions of the user².

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During their lives, children spend approximately a quarter of the day at school, and 80% of that time sitting down doing their school work. Considering the amount of time spent at school and specifically while sitting, it is fundamental that school furniture suit the children's requirements. It is believed that there is a growing mismatch between design features of the furniture used in the classrooms and the anthropometric parameters of the students³.

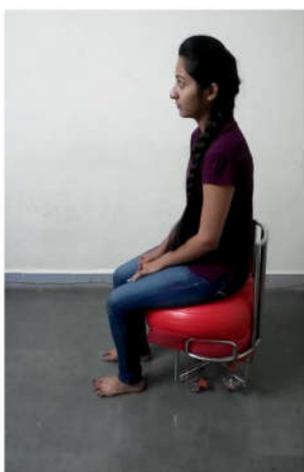
The progressive muscle strengthening using the Swiss ball was effective in improving the muscle strength, walking performance and patient satisfaction in patients. The exercise program has shown good tolerance without deleterious effects on the disease activity⁴. Swiss ball therapy method utilized to solve the general research problem that children with CP have impaired posture, balance, mobility, and function due to atypical muscle tone. The possible areas of swiss ball therapy could improve include head and neck control, trunk alignment, extremity function, and muscle tone⁵.

The swiss ball, can take the abdominals through a complete range of motion through the performance of crunches twisting crunches, where the upper body twists in opposite directions during the crunch to extend the muscular effect across the abdomen; and the flexion of the thoracic spine, the vertebrae of the mid-back to improve overall flexibility. The Swiss ball is an ideal supplement to an existing training program, such as yoga or Pilates, which promote greater strength and flexibility in a safe and controlled physical setting⁶.

Swiss-ball core training programs are among the most popular trends in physiotherapy and strength and conditioning programs. Benefits of Swiss-ball core training exercises that facilitate spinal stability and balance have often been emphasized by researchers to develop strength, endurance, flexibility, and neuromuscular control as a cost effective and enjoyable way to prevent lower back injury and lower back pain⁷. These include increased muscle activation, co-activation and muscle co-contraction. For the most part, studies have looked at the gym ball for its value in rehabilitation and fitness. These studies have concentrated on muscle function, muscle strength and muscle coordination. Studies of this nature are important to help assess the appropriateness of gym ball use for rehabilitation and fitness⁸.

Kinesthetic learners move their bodies in order to learn something new. These learners have a hard time sitting in a chair for an extended period of time. In the past some of these students have been labeled as hyperactive. Others have been called difficult to teach.⁹ Exercise ball chairs have been used by people with poor posture or back problems for several years. They are ergonomic types of ‘chairs’ used by people for sensory seating and they have a positive impact on people for various reasons. Some people refer to them as ‘balance balls’. Some of the more common uses of exercise ball chairs for adults include: Adults with posture, circulation, or back problems, People with poor muscle tone, Individuals who require dynamic seating¹⁰. There has been a considerable increase in the use of the gym ball or Swiss ball as an exercise tool in the last several years. The gym ball is used by trainers in fitness programs and by therapists for injury rehabilitation and prevention. This is due to an improved understanding of spinal stabilization and the role that it plays in back pain.⁸

Flat benches or chairs used in offices and schools are very tedious to sit on for long hours. It weakens the spine and hence brings variation on our posture that can cause muscle weakness or back pains in future. Whereas swiss ball helps to maintain our posture better and due to frequent change in positions it reduces damage caused by prolonged sitting in one position. Sitting on unstable surface all day improves sense of balance, as well as reaction of muscles; it also strengthens our abdominal muscles.



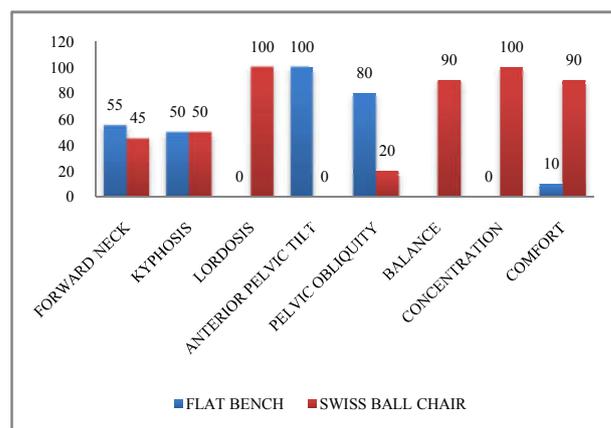
Investigations proved that it improves posture, balance and concentration. But sitting on swiss ball whole day would have again been difficult; hence this was the reason that a swiss ball chair was invented and why there was the need to do this study.

METHODOLOGY

The swiss ball chair was designed which was made up of steel and the seat was molded in a way to fit in swiss ball and give a low back support. It had got wheels for mobilization if needed and stoppers for stability. A swiss ball was fitted in the seat. Before starting the study Ethical committee of VikhePatil Medical College, consent was obtained. Then through convenient sampling, 50 college students from Dr. VithalraoVikhe Patil College Of Physiotherapy were recruited with age group of 20-25 years old. Subjects were asked to sit comfortably on the college bench (flat) for 20 mins and where there posture was assessed and then they were asked to sit on the swiss ball chair for 20 mins, where again there posture were assessed. Subject’s postures were assessed at the beginning, after 10 mins and then 20 mins. Balance and concentration of the subject was checked through the feedback given from the subject at end of the study.

RESULT

Compared to flat bench it was observed that the altered Forward neck position was seen in less than 55% of the subjects, Kyphosis in less than 50%, Lordosis: was normal in 100% of the subjects, Anterior pelvic tilt was absent in 100%, Pelvic obliquity was absent 100%. 90% felt that they could balance on it well, 100% subjects felt that the concentration increased & 90% of the subjects felt that it was more comfortable in long turn. All the findings are concluded according to patient’s response.



DISCUSSION

The effects of a Swiss-ball core strength training protocol on trunk extensor (lower back) and flexor (abdominal) and lower limb extensor (quadriceps) and flexor (hamstring) muscular strength, abdominal and lower back and lower limb endurance, lower back flexibility, and dynamic balance⁷. Evidence from the clinic suggested that replacing the office chair with the gym ball can be helpful for some patients depending on the two case studies³. There are as such no similar studies performed as of to my knowledge.

CONCLUSION

It was concluded that swiss ball chair could be used to improve balance, concentration and posture.

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