

Awareness about Hazards of Physical Inactivity, Advantages and Participation in Physical Activity and Its Components in Junior College Students - A Questionnaire Based Study

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ABSTRACT

Background: Physical inactivity has become a major cause of concern. Along with the numerous ill effects on an individual's health, it poses great economic burden. Recommended levels of physical activity can help to avert the hazards and have protective effects on our body. Lifestyle changes made at an early age will help in adherence and reduction in chances of co morbidities related to sedentary behaviour.

Objective: To evaluate the awareness about hazards of physical inactivity or sedentary behaviour, advantages of physical activity and level of participation in various forms of physical activities.

Methodology: A questionnaire comprising domains of hazards of sedentary behaviour, advantages of physical activity and participation in various forms of physical activity was designed. Post face validation, it was circulated via electronic media among junior college students. Data was collected over a period of four weeks; it was then analyzed and represented as descriptive statistics.

Results: Total of 752 junior college students participated in the study. The study participants were well aware about the hazards of physical inactivity and benefits of physical activity. However many of them did not meet the recommended physical activity levels. Only 26.3% and 41% of the study participants were involved in strength training and flexibility training. Not many of them were involved in warm up and cool down phases.

Conclusion: Though the awareness about advantages of physical activity and hazards of physical inactivity was good, not many of the study participants met the recommended levels of physical activity. Inclusion of strength and flexibility training in workout sessions was low. Thus there is scope of creating awareness about these important aspects of physical activity.

Keywords: Awareness, hazards of sedentary behaviour, Physical activity levels, Junior college students, Questionnaire

INTRODUCTION

Physical inactivity has become a cause of concern for almost every country. Physical inactivity has been attributed to be the fourth leading cause of death worldwide.

^[1] Physical inactivity is associated with paradigm of complications. In addition to the numerous complications or adverse

effects it has on one's health, it also puts an additional economic burden on our society by costing billions of dollars to countries across the world. ^[2]

Physical inactivity can lead to a wide range of complications not only in elderly but also in children and adolescents. As given by Centers for Disease Control and

Prevention, physical inactivity is one of the major risk factor that can lead to development of chronic non communicable diseases. In addition to it, physical inactivity can lead to cardiac diseases along with the likelihood of developing risk factors of cardiac diseases like, obesity, hypertension, hyperlipidemia and type 2 Diabetes.^[3] Physical inactivity can lead to reduced or loss of Insulin sensitivity in skeletal muscle and insulin resistance.^[4] Diabetes is associated with its own set of micro and macro vascular complications. Physical inactivity is also a primary cause of metabolic syndrome.^[5] Physical inactivity is also associated with increased risk of developing certain cancers including, bladder, breast, colon, uterus, lung and so on.^[3] Physical inactivity causes increased risk of dementia and Alzheimer's disease and can also lead to depression.^[5, 6] Poor academic achievement score and inferior cognitive performance has been reported in children who are physically inactive.^[7]

World Health organization has defined physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure- including activities undertaken while working, playing, carrying out household chores, travelling and engaging in recreational pursuits. Exercise is a subcategory of physical activity that is planned, structured, repetitive, and aims to improve or maintain one or more components of physical fitness. Any form of physical activity has immense health benefits.^[8]

Regular physical activity reduces the risk of premature death, cardiovascular diseases, diabetes, certain cancers, and hypertension, also helps to keep blood pressure in check even in hypertensives. Regular physical activities help control weight, builds and maintain healthy bones, muscles and joints. It also helps in reducing the feelings of depression and anxiety and promotes psychological well being.^[9] Improving or maximizing bone mineral mass during childhood and adolescence will in turn help to reduce the fracture risk

during adolescence and possibly in elderly. Dietary habits and regular physical activity with emphasis on weight bearing activities can help to contribute and improve the bone mineral mass gain in children.^[10]

The foundation of physical activity should be laid in childhood and also emphasized in adolescence, for adequate physical activity in youth will help to reap all these health benefits. Adequate exercise in youth will help to improve strength, cardio respiratory fitness and body composition, thereby reducing the risk of developing cardiovascular diseases. , which will provide continued benefits in later stages of life. It will also help to improve psychological well being and academic performance. It will also help to improve bone health and reduce the risk of sports injury.^[11]

Recommended physical activity guidelines have been given by various organizations like Centres for Disease Control and Prevention, World Health Organization, American College of Sports Medicine, American Heart Association and so on. Most of these guidelines recommend moderate or vigorous intensity physical activities or a combination of both on 3-5 days a week, for a minimum of 20-30 minutes per day depending on the intensity of exercise.

Children and youngsters should be encouraged in every possible way to inculcate good physical activity habits. If the foundation is laid at an early age, it will become a part of their lifestyle thereby helping to maximize the benefits of physical activity. In order to plan various programs to promote physical activity in adolescents, it is essential to know their awareness about hazards of physical inactivity or the benefits one could get by being physically active or just knowing their perspective on this crucial topic. Their awareness or their current level of engagement in physical activity will help to plan and implement specific strategies to improve their participation in physical activities. The aim of this study was to assess the awareness

about the hazards of physical inactivity, advantages of physical activity and evaluate the participation in physical activity in junior college students. We also intended to check their awareness about specific components of warm up, cool down, strength and flexibility training. These components are crucial in order to maximize the physiological effects or benefits of exercise.

If these students are made aware about the important aspects of physical activity and the recommended levels of physical activity in order to maximize the benefits obtained from it, it will surely help them to lead healthy lifestyle and thereby reduce the risk of developing co morbidities.

MATERIALS AND METHODS

This was a cross sectional study with junior college students being the study participants. Clearance was sought from the Institutional Ethics Committee, before conducting this study. A questionnaire comprising three domains of hazards of physical inactivity or sedentary behaviour, advantages of physical activity and participation in physical activity was designed using Google forms. All questions were close ended and framed in simple English language. The first domain included questions on the hazards of physical inactivity like, reduced bone strength, increased risk of fractures, chances of being overweight/ obese, increased risk of developing cardiovascular diseases and diabetes, chances of developing certain types of cancer, reduced life span by 3-5 years, memory issues and chances of increased levels of depression.

The second domain included questions regarding the advantages or benefits of doing regular physical activities like, improvement in cardiovascular and respiratory function, lower death risks form cardiac diseases, enhanced feeling of well being, enhanced performance at work and recreational activities. Also, lowered risk of developing Type 2 Diabetes mellitus,

reduction in risk of developing certain types of cancer, improved immunity, reduced risk of stroke, reduced level of anxiety and depression were included. Certain risk factors of cardiovascular diseases like blood pressure, cholesterol/lipid levels, abdominal fat and blood clotting tendency were also included.

The third domain was designed to assess the involvement of study participants in various forms of physical activity. The questions included were if the participants were involved in moderate intensity activities for minimum of 30 minutes for at least five days a week, or vigorous intensity activities for a minimum of 20 minutes on at least three days a week or combination of both for at least 3-5 days a week. The participants were also asked about their involvement in strength training for at least 2 days a week and flexibility training for at least 3-5 days a week. These questions were designed in accordance with the recommended physical activity guidelines given by World Health Organization and Centers for Disease Control and prevention. This domain also included questions on warm up, stretching and cool down, and if it was a part of their workout or training sessions. The participants were also asked about their views on sedentary behaviour and if they were engaged in sitting for more than eight hours per day.

Face validation of the questionnaire was done before circulating it via electronic media. Subject information sheet and informed consent form were provided along with the designed questionnaire. The participation in the study was entirely voluntary and the participants were able to fill in the questionnaire only after consenting to participate in the study. The data collection was done over a period of four weeks. All the forms received during this period were considered for data analysis.

STATISTICAL ANALYSIS

Data was analyzed using Excel Office – Version 2019. Categorical

variables were expressed in terms of frequencies and percentages.

were females. The average age of the study population was 16.5 ±1.29 years.

RESULTS

752 students participated in this study. Out of the total study participants 409(54.4%) were males and 343(45.6%)

Hazards of physical inactivity domain:
The responses of the study participants to various hazards or harmful effects of physical inactivity on our body are demonstrated in Table 1 and Figure 1

Table 1: Distribution of responses on hazards of physical inactivity domain

| Component | Yes Number of participants (percentage) | No Number of participants (percentage) | Not Sure Number of participants (percentage) |
|--|---|--|--|
| Chances of Developing Certain Types of Cancers | 325(43.2%) | 188(25%) | 239(31.8%) |
| Reduced Lifespan by 3-5 years | 350(46.5%) | 178(23.7%) | 224(29.8%) |
| Lead To Memory Issues | 328(43.6%) | 198(26.3%) | 226(30.1%) |
| Increased Levels Of Depression | 468(62.2%) | 122(16.2%) | 162(21.6%) |

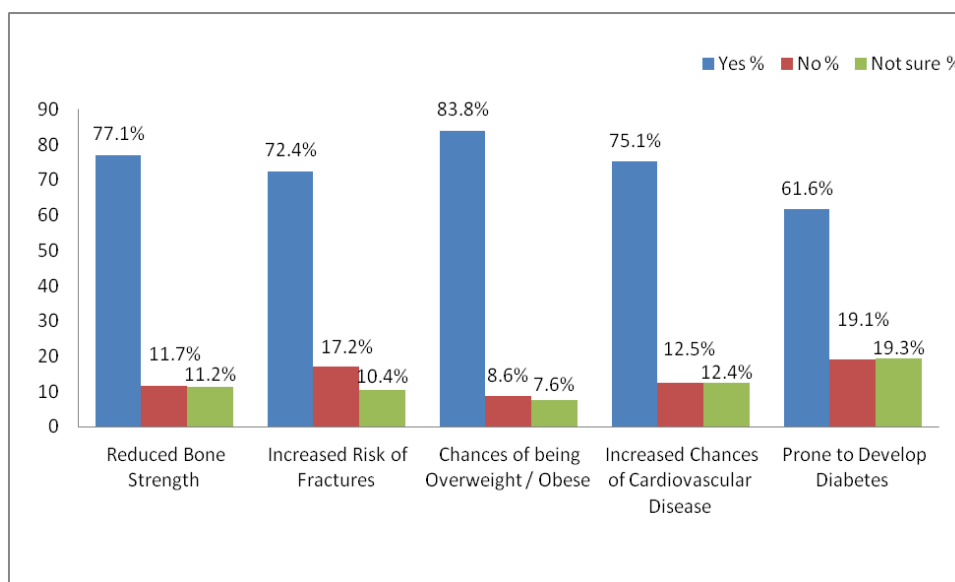


Figure 1: Distribution of hazards of physical inactivity domain responses

Advantages of physical activity domain:

Table 2 and Figure 2 display the distribution of responses in regard to advantages or benefits of regular physical activity on our body. In response to the effect of physical activity on the cardiovascular disease risk factors, 586(77.9%) of the participants said that physical activity will help to reduce blood pressure, 103(13.7%) participants said physical activity will not help to lower this factor, whereas 63(8.4%) of the participants were not sure about it. 563(74.9%) of the participants said exercise or physical activity will help to control cholesterol levels thereby reducing the risk of cardiovascular diseases, 103 (13.7%)

participants said physical activity will not help to reduce cholesterol levels and 86(11.4%) participants were not sure. In terms of effect of physical activity on abdominal fat, 601(79.9%) participants said physical activity will help reduce abdominal fat, 73(9.7%) participants denied the effect of exercise on abdominal fat, whereas 78(10.4%) participants were not sure about it. 333(44.2%) of the study participants said physical activity will help to reduce blood clotting tendency, 138(18.4%) participants said physical activity will not have any effect on blood clotting tendency and 281(37.4%) participants were not sure about it.

Table 2: Distribution of responses on positive effects of physical activity domain

| Component | Yes Number of participants (percentage) | No Number of participants (percentage) | Not sure Number of participants (percentage) |
|---|---|--|--|
| Improvement in Cardiovascular & Respiratory Function | 606 (80.6) | 78 (10.4) | 68(9) |
| Lower Death Risks From Cardiac Diseases | 580(77.1) | 99 (13.2) | 73(9.7) |
| Enhanced Feeling of Well Being | 579(77) | 56 (7.4) | 117 (15.6) |
| Enhanced Performance of Work, Recreational & Sport Activities | 608(80.9) | 52(6.9) | 92 (12.2) |

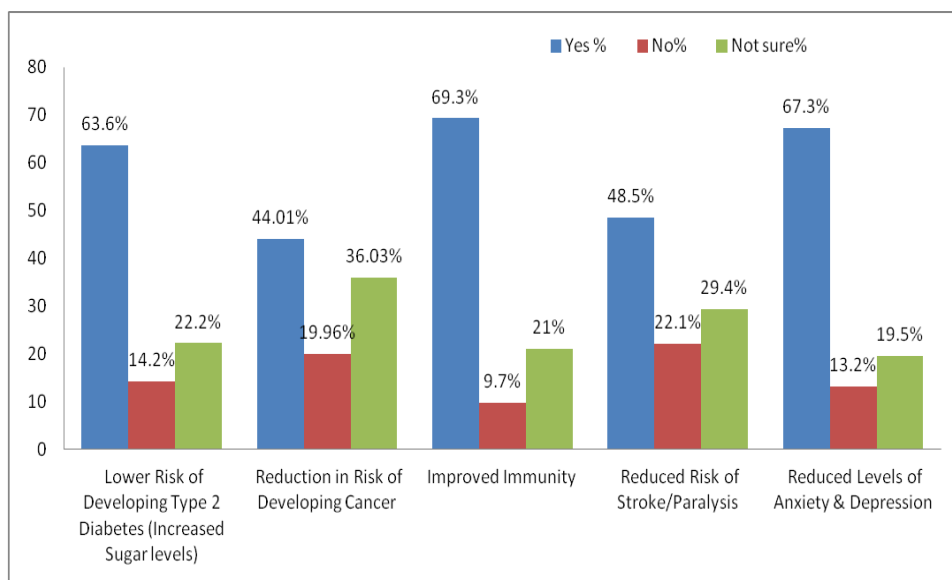


Figure 2: Distribution of positive effects or advantages of physical activity domain responses

Table 3: Distribution of responses about inclusion of various components in workout sessions

| Components of training/ workout session | YES Number of participants (percentage) | NO Number of participants (percentage) |
|---|--|---|
| Strength Training | 198 (26.3%) | 554(73.7%) |
| Flexibility Training | 308 (41%) | 444(59%) |
| Warm up | 484 (64.4%) | 268(35.6%) |
| Stretching | 398 (52.9%) | 354 (47.1%) |
| Cool down | 344 (45.7%) | 408 (54.3%) |

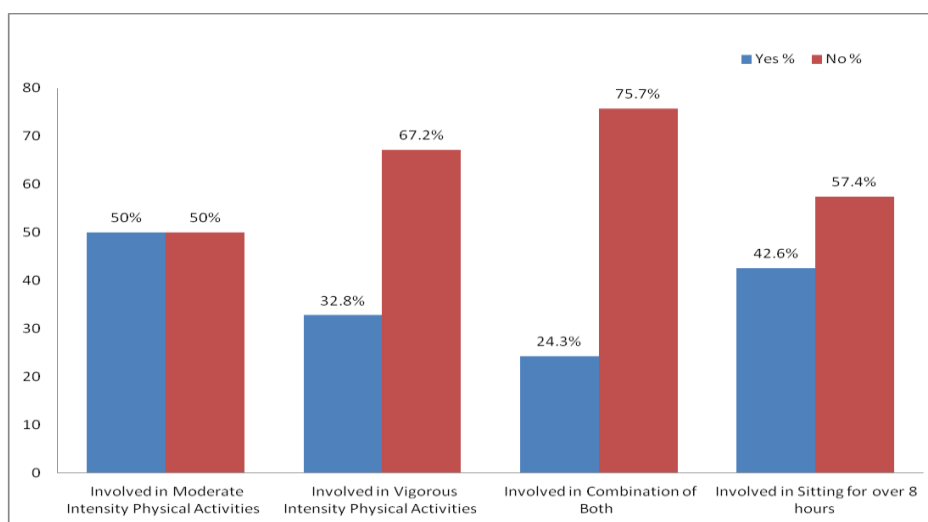


Figure 3: Distribution of involvement in physical activities and sedentary behaviour responses

Participation in Physical Activity domain:

The responses of the study participants about involvement in various exercise or workout sessions of moderate or vigorous or combination of both are demonstrated in Figure 3. It also shows the involvement of the study participants in sitting for more than eight hours per day.

DISCUSSION

The results of this study show that the study participants were well aware about certain advantages of physical activity or hazards of physical inactivity and sedentary behaviour but there are certain aspects of it, which they are either unaware or not very sure about. More than 60% of the study participants knew that physical inactivity or reduced physical activity can lead to reduced bone strength, increased risk of developing fractures, obesity and cardiovascular diseases and diabetes. Approximately 40% of the study participants were not sure about these important hazards or disadvantages of physical activity. Thus there is scope of creating awareness about these aspects of physical inactivity or sedentary behaviour. Over 40 % of the study participants agreed that physical inactivity can increase the risk of developing certain type of cancers, reduce lifespan by 3-5 years, can lead to memory issues and increased levels of depression, whereas approximately 30% of the study participants were not sure about it.

The term “Diseasome of physical inactivity was termed by Pedersen, in order to explain the cluster of diseases that can be predisposed by physical inactivity or abdominal adiposity. It includes Type 2 diabetes, cardiovascular diseases, colon and breast cancer, dementia and depression. According to the authors physical inactivity appears to be a strong and independent risk factor that can lead to accumulation of visceral fat which can be a source of chronic inflammation; in turn contributing to atherosclerosis, insulin resistance, neurodegeneration and tumour growth. [12]

555(73.8 %) of study participants considered sedentary behaviour as harmful whereas 197 (26.2 %) participants did not think of sedentary behaviour as harmful. Table 3 shows the distribution of involvement in various components of a workout or training session including warm up, cool down flexibility and stretching exercises and strength training.

Many studies have also shown that physical inactivity can contribute to reduced bone strength, osteoporosis, thereby increasing the risk of developing fractures. It can also lead to obesity and its associated complications, erectile dysfunction, hypertension, increased arterial stiffness, peripheral arterial diseases, increased arterial stiffness, decreased insulin sensitivity and reduced oxidative capacity. Physical inactivity further affects ones quality of life and can lead to premature death. [5] Inadequate physical activity can also reduce life expectancy by 3-5 years. [13]

Over 75% of the study participants were aware about certain positive effects of physical activity on our body, including improved cardiovascular and respiratory function, lower death risk from cardiac diseases, enhanced feeling of well being, enhanced performance at work and other recreational and sport activities. Also, over 74% of the study participants were aware that physical activity can surely affect certain risk factors of developing cardiovascular diseases, like blood pressure, cholesterol or lipid levels and also abdominal fat. Thus exercise can help to keep a check on these crucial risk factors thereby help in reducing risk of developing cardiovascular diseases. However not many of the participants were sure about the effect of exercise on blood clotting tendency in an individual. Also, 56% of the study participants were either not sure or were of opinion that physical activity had no effect on reducing risk of certain type of cancers. 52% of the study participants were either of opinion that physical activity cannot help to reduce the risk of developing stroke or were

not sure about it. Overall the study participants had good awareness about the positive effects of physical activity on our body except for few aspects which they were not sure about.

According to Centers for Disease Control and Prevention, regular physical activity has numerous advantages including reduction in risk of developing cardiovascular diseases, Type 2 diabetes, metabolic syndrome, cancers including breast, bladder, colon, endometrial, oesophagus, kidney and lungs. Physical activity further helps to improve aerobic and functional capacity, bone and muscles strength and also quality of life. Studies have shown that physical activity is associated with 25-30% reduction in risk of developing stroke. Studies have shown that regular physical activity has reduced risk of all- cause mortality and can lead to three year longer life expectancy. Additionally, every 15 minutes of exercise beyond the minimum of 15 minutes a day can further reduce all cause mortality by 4% and all-cancer mortality by 1%. These benefits are applicable to all age groups, gender and also for those with cardiovascular disease risks. Thus as suggested by these authors, 15 minutes a day or 90 minutes a week of moderate intensity exercise can give great benefits.^[14]

Even though the awareness about different positive effects of exercise was good, not many of them were involved in regular physical activities. Only 50% of the study participants were involved in moderate intensity physical activities whereas only 32.8% of the individuals were engaged in vigorous intensity physical activity and only 24.3% of the participants were involved in a combination of both moderate and vigorous intensity activities. Taking their age group in consideration, they surely should try and get involved in different intensities of physical activity including vigorous. 42.6% of the participants were involved in sitting for more than eight hours per day, which for their age group is alarming and needs to be

discouraged. If they get into habits of sedentary behaviour it will be very difficult to alter it at later stages. This is an aspect that surely needs to be addressed.

American College of Sports Medicine and Centers For Disease Control and Prevention recommends moderate intensity aerobic physical activity for a minimum of 30 minutes on five days a week or vigorous intensity aerobic physical activity for a minimum of 20 minutes on three days a week for all healthy adults aged 18-65 years. Similar guidelines have also been stated by World health Organization and American Heart Association.^[15-17]

More than 45% of the study participants included warm up, stretching and cool down as a part of their workout or training sessions whereas the rest of them did not. These three components of workout are very crucial and each one of it has its own significance. It will be very difficult to achieve the physiological benefits of the workout sessions or physical activities without incorporating these important aspects. Also lack of proper cool down can put an individual at risk of developing injuries. As stated by American Heart Association, a proper warm up helps to increase the temperature and flexibility of muscles, improves efficiency during workouts and helps heart rate, respiratory rate and other parameters to rise gradually to cope up with the increased demands of exercise session. Warm up could include calisthenics or any form of exercise that the person is planning to do but at a lower intensity. Cool down on the other hand needs to be done post workout and is as important as warm up phase. Cool down allows all the increased parameters to gradually return to baseline instead of an abrupt drop in these parameters. Including stretching as a part of cool down phase can also help in reducing lactic acid build up thereby minimizing cramping and soreness. Cool down can again include calisthenics or the form of workout at lower intensity and pace and also stretching exercises.^[18]

Only 26.3% of the study participants were engaged in strength training. Resistance or strength training has been shown to have great benefits. It assists in prevention and management of type 2 diabetes, enhances cardiovascular health, reduces resting blood pressure, decreases triglycerides and low density lipoproteins cholesterol, increases high density lipoprotein cholesterol and promotes bone development. It also improves physical performance, functional independence, cognitive abilities and self esteem.^[19] American College of Sports Medicine as well as World Health Organization recommends strength training as an integral part of training or workout sessions and to be included on at least two days a week.

Also, only 41% of the study participants included flexibility training as a part of their workout sessions. Flexibility helps to move or perform any movement in a smooth manner. This surely helps to improve functional activities as well improve sports performance. This is an important aspect of training which should not be neglected because of its positive effect on muscles and also on reducing the chances of injury. American college of Sports Medicine recommends flexibility training on at least two to three days per week for a minimum of ten minutes.

Awareness needs to be created about these specific aspects of workout by explaining the rationale behind each important component. The beneficial physiological effects of exercise can be maximized by doing workout the right way and incorporating all its specific components.

Clinical implication: This baseline evaluation will help in planning and implementing specific strategies to improve the physical activity participation and also focusing on important aspects of strength , flexibility training and also warm up , and cool down phases.

CONCLUSION

Many of the study participants were aware of the hazards of physical inactivity or benefits of regular physical activity, but not many met the recommended physical activity levels. Also not many were engaged in important aspects of a workout or training session like, warm-up , cool down , strength and flexibility training.

Future scope: Specific strategies can be planned and implemented to improve physical activity; emphasizing on each specific component of a workout session including warm up, cool down, flexibility and strength training.

Conflict of Interest: The authors declare that they have no conflict of interest relevant to this article.

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