

Comparison of knee pain among physically active and sedentary young adults

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Abstract – The knee is a significant weight-bearing joint in the human body. It is one of the most frequent locations of musculoskeletal discomfort and injury. Knee pain can be caused by inherited conditions like osteoarthritis or it can be brought on by unhealthy lifestyle choices like not exercising. Since physical activity levels are the main variable that has the most influence on the health of the knee joints, they account for a substantial share of the causes of knee pain. Therefore, the aim of this study was to compare knee pain among physically active and sedentary young adults. A comparative cross-sectional study was carried out on 159 individuals. Data was collected by using KNEST, KOOS and SNAPPS questionnaires. The three questionnaires revealed that only a small number of variables, such as dislocated kneecap, swelling in the knee, knee pain in the last year, knee catching when moving, difficulty bending to the floor, side of pain, and those who similarly changed their lifestyle, showed substantial differences between the two groups. The p-value for these variables was < 0.05 . However, this cross-sectional survey showed that neither physically active nor sedentary lifestyle produces significant influence on knee pain but there was greater proportion of knee pain among sedentary adults. Hence, we concluded that sedentary lifestyle is a dominant risk factor for knee pain.

Keywords – Knee joint, pain, physically active, sedentary lifestyle, young adult

INTRODUCTION

The knee is a significant weight-bearing joint in the human body and one of the most frequent locations of musculoskeletal discomfort and injury. Bone, muscles, ligaments, tendons, cartilage, and menisci are all present in the knee joint. When one of these structures is ill or injured, you experience knee issues [1]. A person's quality of life is hampered by knee discomfort, which also results in physical impairment. People are finding it difficult to conduct even the most basic daily tasks due to the frequency of knee ailments [2]. Arthritis is just one of the many knee issues brought on by advancing age and ongoing compressive stresses on the knee joint. Accidents or quick movements that strain the knee might lead to the kneecap [3]. There are several causes of chronic knee discomfort. Knee pain can be caused by inherited conditions like osteoarthritis or it can be brought on by unhealthy lifestyle choices like not exercising [4]. For younger adults, the epidemiology of disorders, including patellofemoral pain syndrome and ligament injury, is the primary area of scholarly study [5]. In past year, Knee pain has been associated with old age due to many reasons but now it has become a young age dilemma. Studies suggest that

1 in 4 adults are suffering from knee pain. The number of stiff and painful knee has been increased by 65% in past four decades and this increase cannot be explained by obesity and genetic reasons alone. Out of many causes behind knee pain, levels of physical activity occupy a high percentage for being the main reason that strongly influences on knee joint.

Today, one of the main elements of health promotion activities is the inspiration for physical exercise. In addition to the long-term advantages of exercise for maximum health, overuse of the weight-bearing knee joint can result in articular structural stress and discomfort [6]. The FITT (frequency, intensity, time and type) technique is used to determine if physical activity has a protective or negative effect on the person. Therefore, in order to exercise safely and reap the benefits for your health, you must consider your FITT dimensions [7].

But a large number of people still live sedentary lifestyles. Young people who lead less physically active lives, such as staff members, university students, instructors, and other staff members, are more prone to suffer from common knee problems, and it is suggested that they start getting more exercise [5]. Another has

shown that a vast majority of studies reveal a link between physical inactivity and persistent knee discomfort. The majority of knee discomfort was linked to longer periods of inactivity. However, more research is needed to understand how young adults behave when they experience knee discomfort [8].

According to a study, it is necessary to keep the rest period inside of 24 hours to no more than 10 hours [9]. Researchers found that people who skipped their tasks seemed to be more negatively influenced than people who carried on with their essential responsibilities or engaged in the rest of the day. Reducing physical activity temporarily might ease discomfort, but doing so over the long run can corrupt the body, most notably in the form of muscle weakening. Due to this muscle weakening, joints become more flexible and can bear fewer loads. As a result of the discomfort, the patient avoids exercising even more, which leads to a worsening of their physical condition [10].

OBJECTIVES OF THE STUDY

To compare knee pain among physically active and sedentary young adults

MATERIALS AND METHODS

A comparative cross-sectional study was carried out at several locations around Rawalpindi and Islamabad (such as Iqra University, Riphah College of Rehabilitation Sciences, Riphah International University, and ox fitness den Islamabad, etc) over the course of six months (between February and July 2020). Using a purposive sample technique and fixed eligibility criteria, 159 people were eventually included in the study. In this study, people between the ages of 18 and 35 who are physically active (according to AHA guidelines: 150 minutes of moderate-intensity aerobic activity per week, 75 minutes per week of vigorous activity, or a combination of both, ideally spread evenly) or lead sedentary lifestyles and have knee pain with NPRS reading of less than or equal to 3 were included. However, none of the people listed below were included in this study: post-operative knee joint cases, cognitively impaired, disability and deformity, any medical or psychological condition that prevents individuals from taking part in the study. Before collecting data, all candidates signed consent forms after receiving proper training on the study's methods. The ethical review board for the Faculty of Rehabilitation and Allied Health Sciences also gave its approval (FRAHS). The information was then gathered using the Demographic Questionnaire, which contains inquiries about age, education, occupation, daily sitting time, body mass index (BMI), and physical activity.

We essentially asked additional questions for individuals who were younger than 35. We questioned them about whether they ever had physical issues or injuries that resulted in knee pain that persisted in spite of everything, as well as whether they ever felt any discomfort, agony, or noises in their knees while working. The people who said yes were required to complete the three surveys, KNEST, KOOS, and SNAPPS. The KOOS, KNEST, and SNAPPS questionnaires were utilized as a tool to assess knee discomfort and distinguish between young adults who were physically active and those who were not.

To evaluate knee pain, the Knee Pain Screening Tool (KNEST) survey, which has six items, was employed. The KNEST questionnaire's test-retest reliability and validity were found to be 91% and 74%, respectively. The Survey Instrument for Natural History, Aetiology and Prevalence of Patellofemoral Pain examines (SNAPPS) was utilized for the evaluation of knee issue which remembers inquiries for predominant indications and how the issue is created. The SNAPPS questionnaire's reliability and validity were determined to be 95% and 90%, respectively. The Knee Injury and Osteoarthritis Outcome Score (KOOS) Questionnaire was used to assess knee pain. It has a total score and five subscales, including Pain (9 items), Symptoms (7 items), Function in Daily Life (17 items), Function in Sports and Recreation (5 items), and Quality of Life (4 items). Swedish LK 1.0 of the KOOS questionnaire was found to have test-retest reliability, validity, and responsiveness values of 92%, and 86%, respectively. Some of the information was initially taken from locations in Rawalpindi and Islamabad via face-to-face interviews, but because to the COVID-19 pandemic problem, it was also afterwards acquired through online sources (including phone talks, Whatsapp calls, and emails).

The data was processed by SPSS 20 and then presented in tables, graphs, and pie charts. For quantitative data, mean and standard deviation were calculated, as well as frequency and percentage for qualitative variables. Two groups are examined using the independent T-test. This test looks for statistically significant differences between two independent groups' variables.

RESULTS

A total of 159 young adults participated in the study and response rate was 100%. All participants were those having knee pain due to any reason. Table 1 below displays the means, standard deviations, frequencies, and percentages of the demographic data.

Table 1: Demographics

Variables	Mean ± Standard deviation, Frequency (%)
Mean ± Standard deviation	
Age(years)	23.86 ± 5.36
BMI	22.48 ± 5.07
Daily sitting hours	8.41 ± 3.57
Frequency n (%)	
Gender	
Male	49 (30.1%)
Female	109 (66.9%)
Occupation	
Student	108 (66.3%)
Teacher	7 (4.3%)
Police man	3 (1.8%)
House wife	15 (9.2%)
Office going	18 (11.0%)
Physical trainer	4 (2.5%)
Tailor	1 (0.6%)
Beautician	1 (0.6%)
Driver	1 (0.6%)
Engineer	1 (0.6%)
Physical activity	
Physically active	79 (48.5%)
Physically inactive	80 (49.1%)

Table 2 Independent sample T test for between group analyses (KNEST questionnaire)

Variables	Physical active (Mean ± Standard deviation)	Physical inactive (Mean ± Standard deviation)	p-values
Previous knee injury	2.00 ± 2.20	1.71 ± 0.45	0.76
Knee pain in last year	1.35 ± 0.48	1.47 ± 0.50	0.01*
Laterality of knee pain	1.35 ± 0.48	1.35 ± 0.50	0.82
Chronicity	2.26 ± 1.27	2.26 ± 1.29	0.80
GP consultation	1.73 ± 0.44	1.76 ± 0.45	0.80
Any treatment if taking	3.97 ± 2.96	3.98 ± 3.16	0.10

*= p < 0.05

As shown in table no 2, only a significant difference in knee pain was found between physically active and inactive persons in the last year, as the p value was < 0.05. However, no significant difference was found among the rest of variables as their p-value is > 0.05.

Table 3: Independent sample T test for between group analyses (KOOS questionnaire)

Variables	Physical active (Mean ± Standard deviation)	Physical inactive (Mean ± Standard deviation)	p-values
How often is your knee painful?	2.74±0.86	2.41±0.89	0.40
Degree of pain in last week during twisting/pivoting on your knee?	2.39±1.14	2.31±1.20	0.71
Degree of pain in last week during straightening knee fully?	2.41±1.17	2.03±1.14	0.23
Degree of pain in last week during bending knee fully?	2.53±1.22	2.20±1.26	0.86
Degree of pain in last week during walking on flat surface?	2.08±1.10	1.76±0.98	0.37
Degree of pain in last week during going upstairs/downstairs?	2.59±1.18	2.32±1.27	0.64
Degree of pain in last week at night while in bed?	2.02±0.97	2.03±1.15	0.06
Degree of pain in last week during sitting/lying?	2.00±0.90	1.77±0.96	0.08
Degree of pain in last week while standing upright?	2.20±1.13	1.96±0.97	0.10
Severity of knee stiffness at wakening in the morning	1.69±0.89	1.71±0.94	0.74
Severity of knee stiffness after sitting, lying or having some rest	2.20±1.05	1.92±0.95	0.65
Knee swelling	1.62±0.88	1.53±0.99	0.62
Having any sound from knee like grinding and clicking?	2.56±1.21	2.68±1.36	0.16
Is your knee go away during walking?	2.12±1.00	2.57±1.47	0.00*
Can you straight your knee fully?	1.74±0.96	1.76±1.15	0.07
Can you bend your knee fully?	1.82±1.10	1.77±1.19	0.61
Any knee issue during descending stairs?	2.02±1.08	1.95±1.26	0.32
Any knee issue while stair climbing?	2.30±1.07	2.10±1.22	0.77

Any knee problem rising from sitting?	2.32±1.00	1.96±1.01	0.71
Any knee problem in standing?	2.05±1.06	1.86±0.96	0.55
Any knee problem by bending to floor?	2.20±0.93	1.87±1.08	0.05*
Any knee problem in walking?	1.73±0.95	1.53±0.82	0.23
Any knee problem while moving in and out of car/	1.91±1.06	1.71±1.98	0.52
Any knee problem in shopping?	1.92±1.05	1.82±1.13	0.68
Any knee problem related to putting on socks?	0.70±0.96	1.57±0.92	0.33
Any knee problem rising from bed?	1.77±0.93	1.58±1.88	0.37
Any knee problem as in taking off socks/stockings?	1.75±0.90	1.52±0.82	0.47
Any problem while in bed and position changing?	1.91±1.05	1.70±0.94	0.23
Any problem as in using bathroom?	1.82±0.94	1.61±0.94	0.72
Any problem in sitting?	2.01±0.88	1.61±0.89	0.16
Any problem by getting on/off toilet?	2.08±0.93	1.87±1.09	0.08
Any problem having heavy domestic duties (shoveling, Scrubbing floor)?	2.32±1.22	2.23±1.28	0.74
Any problem by light domestic duties(cooking, dusting)?	2.05±1.03	1.90±1.13	0.32
Any knee problem in crunches?	2.31±1.01	2.03±1.21	0.22
Any knee problem in running?	2.51±1.18	2.17±1.17	0.85
Any knee problem in jumping?	2.54±1.29	2.05±1.20	0.16
Any problem to your injured knee by turning and buckling to your knee?	2.59±1.29	2.10±1.24	0.24
Any problem in kneeling?	2.46±1.24	2.17±1.28	0.76
Generally, are you conscious about your knee problems?	3.01±1.45	2.67±1.41	0.96
Do you change your lifestyle due to knee pain?	2.30±1.28	1.78±1.95	0.02*
Are you having any lack of confidence due to your knee?	1.96±0.92	1.72±0.77	0.63
Overall, how much trouble do you feel with your knee?	2.49±0.90	2.33±1.01	0.49

*= p-value <0.05

Only the knee catch when moving, the difficulty bending to the floor, and those who modified their lifestyle were significantly different between physically active and inactive individuals, as shown in Table No. 3 because their p value is < 0.05. However, because the p-value of the remaining variables is > 0.05, no significant difference was discovered between them.

Table 4: Independent sample T test for between group analyses (KOOS total)

Variables	Mean ± Standard deviation	p-values
Physical active	93.82±28.68	0.50
Physical inactive	84.37±31.29	

As shown in table no 4, Adults who were physically inactive and those who were active both had p-values of > 0.05, which does not indicate a significant difference between them.

Table 5 Independent sample T test for between group analyses (SNAPPS)

Variables	Physical active (Mean ± Standard deviation)	Physical inactive (Mean ± Standard deviation)	P-values
In which knee have you had a pain/problem?	1.46±0.50	1.35±0.47	0.01*
Have you had surgery to your knee?	2.00±0.00	2.00±0.00	N/A
Have you ever had a knee cap that has dislocated?	1.84±0.36	1.95±0.21	0.00*
Any knee swelling?	1.62±0.48	1.72±0.44	0.00*
Any knee complains about a month ago?	1.40±0.49	1.48±0.50	0.09
According to you what is the issue to your knee?	2.51±2.34	3.03±2.46	0.20
Knee pain onset?	1.44±0.49	1.60±0.49	0.29

*= p-value <0.05.

Only a significant difference between physically active and sedentary individuals was found in a

dislocated kneecap, side of pain and swollen knee, as shown in table no. 5 where the p value was less than 0.05. However, no significant difference was found between the other variables because their p-values are > 0.05 .

DISCUSSION

This cross-sectional survey study compared knee pain in physically active and inactive young adults to see which group had the highest prevalence of the condition. Participants were all those who, for any cause, had knee pain. There were more women than men among the 159 participants in the poll. More people were physically inactive than were physically active.

Our study's findings show that those who were physically inactive and those who were active both had the same degree of activity because the p-value is more than 0.05. However, other characteristics, such as a dislocated kneecap, swelling knee, having knee discomfort in the previous year, and knee catching when moving, demonstrated substantial differences between the two groups. The p-value for these variables was < 0.05 , indicating that sedentary people experience knee discomfort more frequently than physically active people. Participants who had trouble bending to the floor, those who experienced pain, and those who altered their lifestyle similarly shown differences with p-values < 0.05 , but the conclusion states that physically active people experienced greater knee discomfort than sedentary people did.

Urquhart, Donna M., and others conducted a study to "investigate the impact of physical activity on knee joint." The analysis's findings revealed that only a small number of researches found a high correlation between physical activity and the knee joint, indicating that the knee joint will become stronger and healthier as physical activity increases. However, numerous additional studies have demonstrated that there need not be a direct link between the knee joint and exercise. Researchers added that more research has shown a negative correlation between physical activity and the knee joint, implying that the more activity a person engages in, the weaker and unhealthier their knee joint would become.[11]

A second cross-sectional study was conducted by Sook-Hyun Lee, Chihyoung Son, and others to examine the "alliance between sedentary behaviour and chronic knee pain." This study established the link between sedentary lifestyle and persistent knee pain. Participants who sat motionless for more than ten hours a day reported chronic knee pain. This study also

discovered that persons who exercised frequently had a lower risk of developing chronic knee discomfort [12].

In order to observe the effects of work-related activities on knee pain and the causes producing knee pain in the working population, H. Miranda, E. Viikari Juntura, et al. undertook a second cohort research. The analysis's findings indicated that there is no connection between exercise and knee discomfort. Only 10% of participants experienced knee discomfort after a year of follow-up, but those who were overweight and had a history of knee injuries were more likely to experience it than those who engaged in high levels of physical activity. Therefore, it was determined in this study that, rather than physical activity, obesity and prior knee injuries are the root causes of knee discomfort [13].

Cohort studies were carried out by Sinead Holden, Michael Skovdal Rathleff, and others to "analyze the prognosis and assess its effect on health of adolescent knee pain." The results of this study demonstrated that following a follow-up of 5 years, people who had knee pain 5 years prior developed more severe and persistent knee pain. They took a step toward a sedentary lifestyle by limiting their levels of physical activity, whether in sports or other daily activities, as a result of the severe knee pain. Therefore, it may be inferred from this research that neither physical activity nor inactivity causes knee pain; rather, it only affects people who have a history of knee discomfort [14].

Chukwuemeka Ibeachu, James Selfe, and colleagues did another cross-sectional study to determine the prevalence of knee pain in young adults and its relationship to physical activity or inactivity. This study, which focused on college students, found that knee problems were more common among young adults who were students and were linked to high levels of physical activity. The findings indicated that people who were overweight reported more knee pain, showing that adults were experiencing more knee difficulties for every 10 kg/m² increase in BMI. This study found that people who were overweight and engaged in high levels of physical activity had knee difficulties, not people who were only physically active [15].

A study was done to determine the "alliance of physical activity and body composition with knee discomfort" by Tao Meng, Benny Antony, Alison Venn, and others. The findings showed that lean mass and balanced exercise have a crucial role in maintaining a healthy knee joint, explaining why those who are not overweight and engage in appropriate and balanced exercise do not experience knee problems.

This study also demonstrated that obesity, in addition to physical activity, plays a role in knee discomfort because it makes the cartilage and bone in the knee joints weaker, which prevents physical activity from making knee problems worse [16].

CONCLUSION AND RECOMMENDATION

This cross-sectional survey revealed that persons who lead sedentary lifestyles experience a higher proportion of knee discomfort than those who lead physically active lifestyles. Therefore, we came to the conclusion that a sedentary lifestyle is the main risk factor for knee discomfort. The COVID-19 outbreak, the lower number of participants, and the use of online data collecting may have all contributed to the study's weaknesses, which may have led to inconsistent results. It is recommended that more research be done on the general population and on the prevention of knee discomfort in young adults who are not physically active. The effects of both moderate and vigorous physical activity on knee pain should be studied.

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