PREVALENCE OF KNEE PAIN IN YOUNG ADULT FEMALES IN SELECTED EDUCATIONAL INSTITUTES OF HAYATABAD, PESHAWAR

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Abstract

AIM: To determine the prevalence of knee pain in young adult females at selected educational institutes of Hayatabad, Peshawar.

METHODS: A cross sectional survey was conducted in which a total of 410 females between 18 and 27 years of age participated. Mean age of the participants was 20.56 ± 2.081 years. Participants were recruited by consecutive sampling from different universities of Hayatabad and enrolled in the study according to the specified selection criteria. All of the participants completed Modified Pain and Mobility Assessment Questionnaire, which was evaluated on Oxford Knee Score.

RESULTS: Prevalence of knee pain was recorded to be 40.2% in the female population. Out of this, 21.8% and 24.2% had left and right knee pain, respectively, whereas 53.9% were having bilateral knee pain. A total of 73.3% female participants reported prolong sitting to be the most aggravating factor. Knee pain among the subjects was found to be of moderate intensity that may cause daily activity restrictions. Distant walking was reported to be restricted by 40.6% respondents. The Oxford Knee Score showed that maximum participants had a grade 3 score of their knee pain, in which conservative treatment may be enough to cure knee pain. However, majority of the subjects were neither having any change in their knee pain nor were they seeking for any help to cure knee pain.

CONCLUSION: A high prevalence rate of knee pain was found among young adult females without any underlying knee pathology or degeneration. Painful knees among young females was a leading cause to limit their daily life activities due to which they were prone toward a sedentary life style which can lead them to secondary problems like early osteoarthritis and knee disorders etc. The findings of this study have important clinical implications for prevention and early management of knee pain at a younger age.

KEY WORDS: Knee pain, prevalence, idiopathic knee pain, epidemiology, pain and mobility assessment questionnaire, oxford knee score.

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INTRODUCTION

Walking is the most common way by which an individual can stay physically active[1], however, knee pain can be a major disabling problem among the most active part of the population i.e. the young adults.[2] The prevalence of knee pain was reported 3.9% among children of age 9-10 years,[2] 3.3% in the age of 10-19 years,[3] 25% in adults of age 18-35 years,[4] 28% in those older than 45 years, and about 37% in elderly aged 65 years and above[5]. In Finland knee pain prevalence among teen agers was reported to be 18.5%.[2] In China, 39% of youngsters aged 16 years or above had knee pain[6].

Females are 2.23 times more prone to have Patello-femoral pain than males.[7] Prevalence of anterior knee pain among women aged 18-35 years was reported 12-13%.[4] An increased Q-angle of 2-3 degrees was found to be causing knee pain among girls aged 15-23 years[8]. A 16 years follow up was carried out upon adolescent girls having idiopathic anterior knee pain, 71% girls continued to have knee pain for 20 years.[9] Knee joint is the most common site of ailment[10] and accounts 33% of all musculoskeletal problems[11]. It is involved in carrying whole body weight in most activities of our daily life[10]. It has 6 degrees of freedom of movement; 3 translations and 3 ro-

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tations. Anatomically, the bones that comprise the knee joint are femur, patella, tibia and fibula which all together make the patello-femoral and the tibiofemoral joints of the knee[12].

Different pathologies causing knee pain are patello-femoral pain syndrome (PFPS)[13]/runner's knee, patellar mal-alignment,[8] synovial plica, chondromalacia patella,[14] ilio-tibial band (ITB) friction syndrome, meniscal tears,[15] ligamentous injuries mainly ACL,[16] patellar tendonitis, Osgood schlatter's disease, Hoffa's fat pad disease, bursitis[17] (prepatellar, infra-patellar,[12] pes ancerine[3]), baker's cyst, reiter's syndrome, septic arthritis,[18] bipartite patella and stress fractures[19]. These all pathologies are common at a younger age as there are no degenerative processes involved in them.

Biomechanical problems that can lead to knee pain are increased Q-angle (commonly found among females), patella alta, femoral anteversion, genu valgum/varum, increased sulcus angle,[20] calf tightness, hamstring tightness, hip muscle weakness, quadriceps tightness, vastus medialis oblique weakness, iliotibial band tightness, pes planus and pes cavus[17].

Among all knee abnormalities the underlying pathophysiology is either muscular imbalances, physical overloading or anatomical mal-alignments[21]. Apart from these, an externally placed trauma over knee is also commonly seen among youngsters.[3] In young females the most common cause of knee pain is the patello-femoral pain syndrome/runner's knee especially in those who are physically active[4 13]. About 70% of PFPS is found in 16 to 25 years of age[7].

All knee pathologies have their own symptomatic presentation but the common presentation of knee pain among young females is pain over the front of knee, around the patella[22] or reteropatellar, with tenderness on palpation can be found.[3] The knee pain usually aggravates with squatting, prolong sitting, going up or down stairs[23] and kneeling.[3] Knee pain can be felt while getting in or out of the vehicle or bed.[3] Patients may also complaint of giving way and locking of the knee joint.[11] Knee effusion can also be present sometimes.[3] Balance problems and an increased postural sway can be found in people with knee pain.[24] Many individuals reduce their activity level because of their knee pain however those with mild pain does not need to decrease their performance.[3]

The most probable risk factors for incidence knee pain were reported to be increasing age, female gender, an increased body mass index (BMI), smoking, previous knee injury, work-related factors, physical exercise[25] and foot angulations as it would change the direction and impact of forces through the tibial plateaus.[24] There are still many other factors that makes the females susceptible to knee pain e.g. female sex hormones[26] that slows down the bone turn-over[24] and also gives higher perception of pain, higher rate of obesity in female gender, use of contraceptive pills and wearing of high heeled shoes.[26] With every 1-lb rise in body weight, the forces passing across the knee joint are increased by 2-3 lb during single leg stance.[27] Unhealthy diet such as oxidative stress is also reported to have negative impact over the knee hyaline cartilage and certain antioxidants like vitamin C and E may have beneficial effects.[24] Certain occupations that involve kneeling, squatting, heavy lifting, climbing stairs, walking on uneven grounds increases loads and forces across the knee joint and becomes a risk factor to develop knee related problems.[27] Psychological factors like anxiety, depression and poor health perception also play a role in higher perception of knee pain and disability.[24]

METHODS

A cross sectional survey was conducted, data were collected from a sample which was a representative of the population. The study was conducted at the selected educational institutes of Hayatabad including Institute of Basic Medical Sciences (IBMS), Khyber Girls Medical College (KGMC), Institute of Physical Medicine and Rehabilitation (IPMR), Institute of Nursing Sciences (INS), Institute of Public Health and Social Sciences (IPH&SS), Institute of Paramedical Sciences (IPMS), Institute of Community Ophthalmology (PICO), Mehboob School of Physiotherapy (MSP) and IM Sciences. The study enrolled a total number of 410 participants. The sample was selected according to the inclusion criteria, which was age of 18 to 27 years old participants. This age group was selected to avoid difficulties in differentiating between idiopathic knee pains than that of degenerative knee pain which is apparent in early 30s as early osteoarthritic changes.[28] Only female participants were included in the study. Participants who had knee pain as well as other pathologies e.g. rheumatoid arthritis, gout, and back problems that radiates pain down to knees were excluded. Participants were also excluded if they had a history of knee joint fractures or severe trauma to knee joint or undergone any surgical procedures of knee joint.

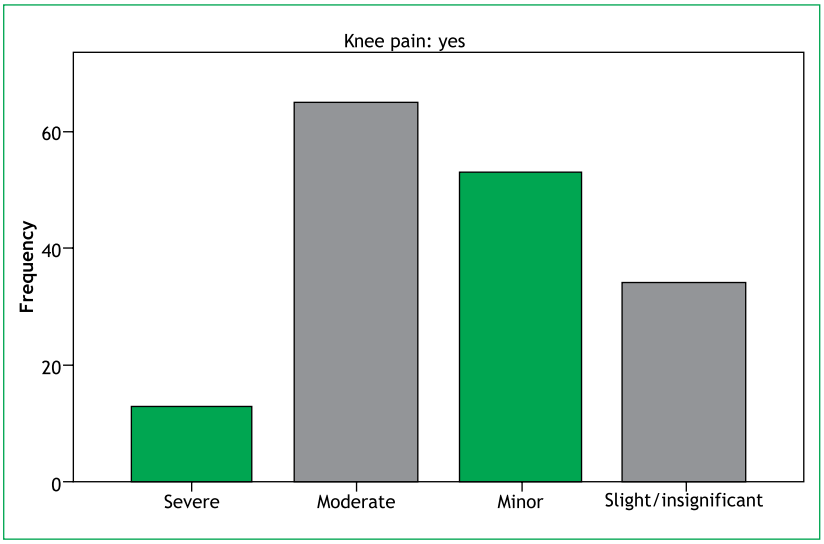
Non probability sampling was carried out and the participants were recruited in the study by consecutive sampling. A total of 410 participants were enrolled in the study after getting the informed consent. Initially, 450 questionnaires were distributed, out of which 25 participants were excluded because they did not meet the inclusion criteria and 15 questionnaires were dropped out because of incomplete information provided. The total time duration for this study was 6 months.

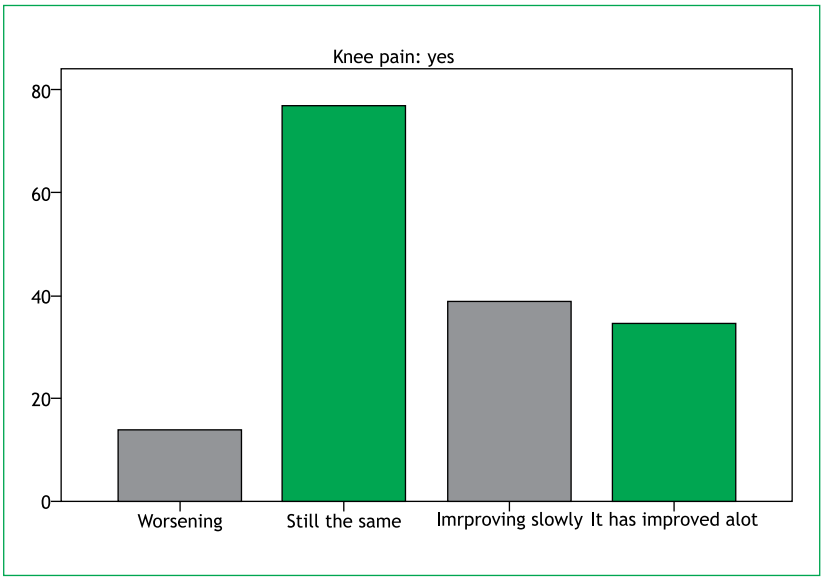
A Modified Pain and Mobility Assessment Questionnaire was distributed among the participants. It was a self-administered questionnaire

which had initial demographics and screening questions. The questionnaire comprised of three parts. The first part had basic questions regarding knee pain (e.g. quality, intensity, duration and occurrence of knee pain), second part had questions regarding knee pain during life and daily activities (e.g. climbing stairs, distant walking, prolong sitting/ standing and wearing heels etc), and the third part had questions regarding treatment (e.g. current or past treatments opted and to assess whether the knee pain was improving or worsening). Each questionnaire was then graded on the Oxford Knee Score (OKS) which is a validated scoring system. The oxford knee score has a scale of 0-48, with 0 representing the worst severe knee dysfunction and 48 indicates a satisfactory knee joint functioning. The score is divided into 4 ranges (score 0 to 19, 20 to 29, 30 to 39 and 40 to 49) showing the severity of knee pain that each participant had. Data was analyzed using SPSS version 20. Mean and standard deviation were shown for the demographic data.

RESULTS

In this study, 410 females from the age group of 18 to 27 years were included to calculate the results. The female participants' were divided into 3 age groups (up to 21 years, 21 to 24 years, 24 years and above) as shown in table-1. The mean age of the participants were calculated to be 20.56 ± 2.081 years. The minimum age of participants was 18 years, whereas the maximum age was 27 years. The results were calculated through the information provided via self-administered questionnaires. The maximum prevalence of knee pain was found among the females of 1st age group i.e. from 18 to 21 years of age. Pain among the subjects was not found to be of very high intensity i.e. 71.5% females had a pain intensity of either moderate or minor level (figure-1) which was still enough to limit them from participating in daily life activities. Only





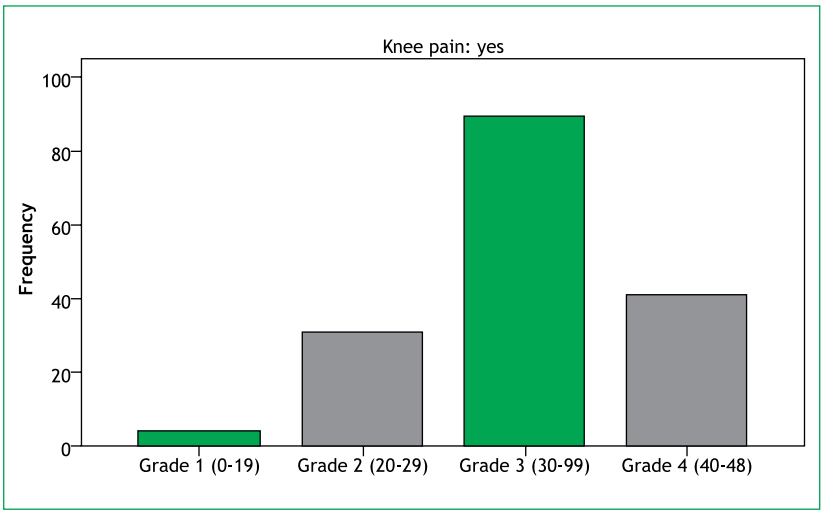


Table 1: Age groups

Class intervals	Frequency	Percent	Valid Percent
Upto 21.00 years	302	73.7	73.7
21.01 to 24.00 years	87	21.2	21.2
24.01 years and above	21	5.1	5.1
Total	410	100.0	100.0

Table 2: Side of knee that hurts

Knee	Frequency	Percent	Valid Percent
Right knee	40	24.2	24.2
Left knee	36	21.8	21.8
Both knees	89	53.9	53.9
Total	165	100.0	100.0

Table 3: Aggravating factors

Activities that aggravates knee pain	Yes N (%)	No N (%)
Kneeling	75 (45.5%)	90 (54.5%)
Squatting	66 (40.0%)	99 (60.0%)
Going up or down stairs	90 (54.5%)	75 (45.5%)
Getting up from or sitting down on a chair	45 (27.3%)	120 (72.7%)
Exercising	68 (41.2%)	97 (58.8%)
Sitting for long periods of time	121 (73.3%)	44 (26.7%)
Standing in a line	63 (38.2%)	102 (61.8%)
Tying shoes	16 (9.7%)	149 (90.3%)
Wearing heels	72 (43.6%)	93 (56.4%)
Playing any kind of sports	58 (35.2%)	107 (64.8%)

Table 4: Treatment of knee pain

Treatments opted	Frequency	Percent	Valid Percent
Orthopedic specialists/ physician	20	12.1	12.1
Physical therapist	14	8.5	8.5
Home remedies (e.g. ice/ heat packs, topical creams, bandages etc)	26	15.8	15.8
I have not spoken with any medical specialist	105	63.6	63.6
Total	165	100.0	100.0

7.9% participants had severe knee pain. Among the painful participants, 53.9% females had a complaint of bilateral knee pain (table-2). Maximum number of participants (41.2%) had a recent onset of knee pain i.e. they started experiencing knee pain from the last 1 to 3 weeks however 33.9% females were complaining of a chronic knee pain from more than 1 year. About 73.3% participants reported prolong sitting to be the most aggravating factor in knee pain (table-3). Figure 2 shows that maximum participants (46.7%) were complaining of knee pain without any change in their symptoms. On the other side, 44.8% reported improvement in their knee pain, whereas, only 8.5% of the participants were worsening. Surprisingly, despite of a large number of sample having knee pain, along with having activity restrictions, were not seeking any kind of help to cure it (table-4). About 63.6% of the participants had not spoken to any medical specialist about their knee pain (table-4). The information gathered was graded according to Oxford Knee Score (OKS) as shown in figure 3. It shows that only 2.4% of the participants scored grade 1 on OKS indicating severe knee dysfunction and were highly recommended for a proper treatment whether conservative or non-conservative. About 18.8% of the subjects were laying in grade 2, showing a moderate to severe amount of knee dysfunction and suggesting that they should seek treatment from an orthopedic specialist. The majority of the participants i.e. 53.9% scored grade 3 in OKS which represents that they had mild to moderate level of knee dysfunction which can be cured by conservative treatment. On the other side 24.8% scored grade 4 which indicates that they had a satisfactory knee joint functioning and they may not require any formal treatment. Thus The Oxford Knee Score showed that maximum participants had a grade 3 score of their knee pain, in which conservative treatment can be enough to cure knee pain.

DISCUSSION

Previous studies have shown varying level of knee joint pain prevalence, such as Roush et al (2012), reported the prevalence of knee pain in females at a mean age of 24.74 years, to be 12-13%.[4] In the current study, out of 40.2% females with knee joint pain, more than half of them (53.9%) had a complaint of bilateral knee pain where as 24.2% and 21.8% reported right and left knee pain respectively (table-2). Roush also reported knee pain to be 13% in right knee and 12% in left knee among female population of 18 to 35 years. Results of the current

study reveal that the female participants had knee pain in activities like prolong sitting (73.3%), stair climbing (54.5%), kneeling (45.5%), exercising (41.2%) and squatting (40%) shown in table-3. A study done by Sandow also reports that female participants between the age of 10 to 20 years, gave a history of knee pain on prolong sitting (48.1%), climbing stairs (50%) and squatting.[14] Similarly, another study by Witonski (1999) showed that female participants between the age of 15 to 23 years also had knee pain complaints on squatting, stair climbing and prolong sitting.[8] Thus the findings of current study are consistent with previous studies.

A contributing factor to knee pain in young females is the use of high heeled shoes. In this study, 46.5% of females reported knee pain due to wearing of high heels where as 37% females restricted the use of high heels because of knee pain. These findings are supported by Dawson et al (2003) that wearing high heels among females may be a risk factor of knee pain and osteoarthritis of knees.[26]

The majority of the participants in this study reported that they were still having knee pain without any improvement or worsening in their pain (figure-2). A study by Stathopulu et al (2003) also showed the same results that 91% of their participants (at a mean age of 22 years) were still in knee pain. He also reported that only 4 participants of his study were not having any kind of treatment for their knee pain, which goes contrary to this study where maximum participants i.e. 105 out of 165 have not even spoken to, about their knee pain, to any medical specialist (table-4) which shows that the maximum of our young females are not seeking any kind of help to cure knee pain and that predisposes them to future knee related problems.

According to Patil et al (2010), idiopathic knee pain is very common in young adults yet its exact cause is unknown. However, among the contributing factors were patellofemoral joint dysfunction, muscular imbalances, extremity mal-alignment and physical over activity in youngsters at an age of 11 to 25 years old.[21] Furthermore, a study done by Lloyd et al (2003) on females of age 12 to 21 years, have patello-femoral pain because of weakness of vastus medialis obliquus, decreased flexibility of hamstrings, ilio-tibial band and quadriceps, patella alta and femoral ante-version suggesting that biomechanical mal-alingnment leads to patello-femoral pain.[29]

CONCLUSION

In conclusion, the overall prevalence rate of knee pain was 40.2% among the study subjects. This suggests a demand to identify the causative agents and risk factors of knee pain, so that preventive measures can be taken and knee related pathologies and disabilities may be minimized. This study supports the fact that idiopathic knee pain was present in young females, when there are no degenerative changes in the joints and was restricting their activities of their daily living. The study results exhibits many functional limitations and disabilities that the participants experienced because of knee pain. In addition, maximum participants of the study were not having any kind of help to cure their knee pain which would predispose them to early osteoarthritis and other knee related disorders. The findings of this study have important clinical implications for prevention and early management of knee pain. It is suggested that further research should be done to evaluate the causes and risk factors of knee pain occurrence at a younger age.

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NOTES ON CONTRIBUTORS

The study was part of A Bachelors in Physical Therapy Education. SF,DAK & MBAJ supervised the dissertation, and was involved in every part of the analysis, idea's development, and write-up.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

ETHICS APPROVAL

The approval/permission was obtained from Khyber Medical University Research and Ethics Board.

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