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Editorial

Original Article

Case Report

Editorial

ROLE OF INNOVATION IN SURGERY: HISTORICAL PERSPECTIVE AND A WAY FORWARD IN LOW-RESOURCE SETTINGS

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Innovation in operative techniques and instruments is the lifeline of surgical advancement, as surgery has always stood at the intersection of skill, science, and technology. Historically, innovation has played a pivotal role in the evolution of surgical instruments and techniques, refining them from crude tools and basic open procedures to complex and highly advanced minimally invasive and robotic techniques. Thus, innovation has shaped every aspect of surgical care. This editorial highlights key historical milestones, recent advancements, and future prospects of innovation in surgery, emphasizing its critical role in improving patient outcomes, surgical safety, and expanding the scope of procedures—especially in low-resource settings. Although the history of surgery dates back to ancient times, early surgical practices were extremely limited due to poor understanding of anatomy, lack of infection control, and absence of anesthesia. Past surgeons like Hippocrates, Al-Zahrawi and many others innovated many surgical instruments and techniques.[1,2] Later, landmark innovations—such as antisepsis by Joseph Lister, ether anesthesia by William Morton, and the discovery of antibiotics by Alexander Fleming—revolutionized surgical safety and feasibility [3]. John Hunter is recognized as the father of modern surgery due to his introduction of evidence-based and systematic surgical innovations.[4] The development of sutures, sterilization techniques, and blood transfusion further expanded the possibilities of surgery. Throughout the early 20th century, open surgery dominated, gradually becoming more refined with improved anatomical knowledge and surgical physiology. By the late 20th century, new innovations like minimally invasive surgical techniques i.e. laparoscopic and thoracoscopic surgeries, brought a paradigm shift by improving the patient outcomes in terms of reduced trauma, faster recovery, safety, cost-effectiveness, and cosmetic results .[5] Today's surgical landscape is increasingly shaped by ongoing widespread adoption of robotic systems, computer-assisted navigation, and image-guided interventions that enhance precision and control[6.] Technologies such as Artificial Intelligence (AI), Augmented Reality (AR), and 3D printing are now progressively integrated to preoperative planning, intraoperative guidance, and postoperative care—particularly in complex surgeries.[7,8] Telemedicine and virtual surgical training have opened new doors, especially for surgeons in low-resource settings, by providing real-time mentorship and continuous professional development.[8] Looking ahead, surgical innovation is set to deliver personalized, data-driven, and patient-centered care. AI-powered platforms will likely assist in clinical decision-making, risk prediction, and real-time intraoperative navigation with minimal human input. [7,8] Emerging fields such as regenerative medicine, tissue bioprinting, and nanotechnology may soon enable repair or replacement of complex structures like the esophagus in long gap esophageal atresia or corrosive injuries, colon

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in extensive Hirschsprung's disease or short gut syndrome, and diaphragm in congenital diaphragmatic hernias, the challenges previously considered nearly insurmountable. [9,10] Fully autonomous robotic systems, capable of executing complex tasks independently, represent a future possibility. A key challenge is preserving the human element in surgical care as we adopt AI-driven and autonomous technologies. Ensuring equitable access to innovation is also crucial; advanced tools such as robotic surgery are often costly and infrastructure-dependent, posing significant barriers to their usage in low-resource settings. Another challenge is preparing future surgeons to balance technology with clinical judgment and empathy. The long learning curves and risk of over-reliance on technology must be addressed. These issues can be mitigated through cost-effective innovations, telesurgery, and mentorship-based training. [7,8] Surgeons must not only master new tools but also apply them with compassion and clinical wisdom. The real challenge is how to make these innovations more useful and practical in third world countries like Pakistan, which have large populations and limited infrastructure. In low-resource settings, innovation assumes a different but equally important role. Minimally invasive surgeries (laparoscopic/endoscopic) can reduce hospital stays, speed up recovery, and decrease complications, thus resulting in early discharge of patients, so helping in reducing the burden on healthcare systems in such settings. Development of low-cost surgical kits, utilizing solar-powered sterilizers, and using portable anesthesia devices can enable safe surgeries in remote areas. Telementoring platforms can train local surgeons, reducing dependency on visiting specialists[7,8.] Low-cost simulators and box trainers can help build technical capacity. low cost systems are now introduced by countries like China, India and Pakistan and more widely utilized. AI-powered portable imaging and diagnostic devices can improve early detection of surgical diseases and help in preoperative planning, reducing unnecessary referrals and delays from periphery to tertiary care hospitals. AI-driven logistics and inventory systems can help manage limited surgical resources more efficiently. In the future, simplified and affordable robotic systems may perform essential procedures even in peripheral health facilities. In this digital age, data privacy, device regulation, and informed patient consent are major ethical concerns that must be addressed in implementation strategies especially in resource constrained settings where ethical practices are poorly observed. Strong ethical, legal, and regulatory frameworks are essential to ensure safe and equitable implementation of surgical innovations.[11] So surgical innovations, if adapted to simplicity, affordability, and local relevance, can significantly improve surgical capacity, safety, and outcomes in underdeveloped countries. It is suggested that future efforts should prioritize cost-effective, durable, and scalable solutions, combined with local training programs, to bridge the surgical equity gap globally, regionally and locally. The true success of Innovation lies in mindful adoption. The IDEAL framework (Idea, Development, Exploration, Assessment, Long-term follow-up) provides a structured method for safe introduction and evaluation of surgical innovations .[12] Surgeons, especially those from resource-constrained countries like Pakistan, should always be prepared and develop the habit of introducing new ideas, innovative techniques, and cost-effective solutions to make advanced surgical technologies feasible in local settings. However, they must receive hands-on training through simulation and mentorship before integrating these new tools into their clinical practice .[13] Surgical innovation has transformed the field from basic manual procedures to advanced, technology-driven care. As we enter an era of personalized and data-guided surgery, it is important that progress should remain focused on patient needs, ethical considerations, and global perspective. For low-resource settings like third

world countries and rural areas, cost-effective and accessible innovations are pivotal. The journey of surgical innovation is ongoing so every surgeon should make habit of innovating new techniques and instruments feasible to their local setting. By working together and introducing new innovations, surgeons, researchers, and technologists can improve patient's safety, expand treatment options, and enhance quality of life even in resource constrained settings.

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Original Article

IMPACT OF COVID-19 PANDEMIC ON CHILDREN AND ADOLESCENT'S PATTERNS & LIFESTYLE BEHAVIORS

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Abstract:

Background: Covid-19 pandemic has influence all ages and both genders. The Major impact observed was our life of children and adolescent in terms of social isolation. The objective of this study was to assess the impact of COVID-19 pandemic on life style patterns and behaviors of children and adolescents.

Material and Methods: An analytical cross-sectional study was conducted at Akhtar Saeed Medical and Dental College, Lahore from April to September 2021. The study included 323 parents of children and adolescent (4-18) all over Pakistan through convenience sampling. Data was collected on an online google survey form. Data was analyzed by SPSS version 23. Bivariate analysis was conducted to compare the difference in lifestyles and behavioral change between children and adolescent during Covid-19, in Pakistan considering p-value less than 0.05 as significant.

Results: In a total of 323 children and adolescents, 189 (58.5%) were males and 134 (41.5%) were females. The mean age of children and adolescents was 11.2 ± 4.2 years. A significant association with consumption of fast food per week(p=0.031), fear of getting COVID-19 (p =0.041), feeling anxious due to pandemic (p=0.040) was found in behavior related to adolescent's lifestyle changes as compared to children. Also, a significant association was found in involvement in indoor physical activities per week(p=0.045) and using social media more than 7 hours per day (p= 0.042) in children's lifestyle as compared with adolescents.

Conclusions: Significant difference was observed in lifestyle behaviors of adolescents with regard to their eating habits, fear of getting covid, anxious behavior due to Covid-19 pandemic whereas significant difference was observed in lifestyle behaviors of children with regard to use of social media and indoor physical activities.

Key Words: Lifestyle behaviors, children, adolescents, covid-19.

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INTRODUCTION

World Health Organization (WHO), reported that the Covid-19 pandemic caused 695,367,480 confirmed cases around the world playing a key role in the lifestyle change of children and adolescents.[1] Fortunately, children and adolescents have a mild clinical spectrum of COVID-19 because of variations in susceptibility. while older children and adults have protective immunity to established viruses due to earlier exposures and vaccinations. All demographic groups were previously uninfected with SARS-CoV-2.[2] The most common symptoms observed in those children

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and adolescent who got the disease were fever and cough, sore throat, fatigue and mild diarrhea.[3] The major reasons of mild presentation of disease in children and adolescents is unknown however possible contributors include an immature immune system to provide defence against harmful effects secondary to viral infection and abnormal immune system activation.[4] An estimated 1.5 billion children and adolescents (age less than 18 years) transitioned to online of learning because of school closures; coupled with social distancing, quarantine, and isolation had a great impacting on lifestyle and activities of children and adolescents. This resulted in lack of social interaction, lack of motivation, limited access to learning resources and support and technical difficulties in learning.[5] In China, only 66% of the children were rated inactive during the pandemic, and similar reports were seen in Canadian children showing reduced physical activity and increase in sedentary lifestyle.[6] Change in eating pattern was also observed, where 43.5% of Polish youth reported eating more during quarantine, and 51.8% of respondents admitted of increase in snacking habit during COVID home quarantine.[7] An Italian study found out that children had increased screen and sleeping time during COVID-19 lockdown resulting in obesity. The risk for depression, anxiety, suicide, and poor mental health were also reported among children and adolescents.[8] Fear of infection, uncertainty, isolation, stress, and mass panic have shown increased trend during this time period. Education institutes in Pakistan underwent remote working, variable gathering size constraints, and quarantine following contact with a COVID-19 case was maintained.[10] Additionally, the closures of daycare, schools, colleges and playgrounds was adopted to limit the spread of disease. These measures had produced consequences on children's and youth psychological development. They also had affected workplace environment of parents that negatively affected the health and well-being of adults.[11] Psychiatric studies on children's and adolescents' mental health during this pandemic era have been widely disseminated in China and the United States. Their coping mechanisms are ineffective and emotionally immature, and their cognitive development in particular was significantly aging impacted. Despite the fact that they are still through important developmental tasks, these characteristics of young people make them susceptible to stressful situations during disasters. Therefore, because elevated anxiety hinders their ability to learn, youngsters are particularly vulnerable in disasters like COVID-19.[12] The nature and extent of impact of COVID-19 on this age group depends on a lot of factors and there is very little research done on this area in Pakistan. This study is planned to quantify the frequency of having impacted lifestyle due to COVID-19 pandemic among children and adolescents.

MATERIALS AND METHODS

An analytical cross-sectional study was conducted in Akhtar Saeed Medical and Dental College Lahore between April 2021 to September 2021 using online survey tool. A sample size of 278 was calculated through Rao soft sample size calculator keeping the confidence level at 95% and the margin of error at 5%. To increase validity, a final sample size of 323 was planned. Permission to collect data was granted after getting approval from IRB Certification Number (M-19/057-CM). To access validity of questionnaire, pilot testing was done on 25 parents of children and adolescents. Changes were incorporated in the final questionnaire. An e-consent form was taken from participants. Parents of children and adolescents (3-19) living in Pakistan were included in this study. Childhood is the period from birth till before puberty, ages 3-9 years.[13] Adolescence were categorized as between ages of 10 to 19 years.[14] Lifestyle behavior have been operationalized as daily activities resulting from individuals eating habits, educational, emotional and social context.[15] Data was entered in the SPSS version 23. The

test of significance applied was Chi-square and *p* values were fixed at ≤ 0.05 to find out significant associations between child's age and lifestyle behavioral change.

RESULTS

In a total of 323 children and adolescents, 189 (58.5%) were Males and 134 (41.5%) were Females. The mean age of children and adolescents was 11.2 years with a standard deviation of ± 4.2 years.

Table 1: Socio-demographic characteristics of Children and Adolescents

Characteristics	Frequency (n=323)	Percentage (%)
Age in Years		
Children 3 - 9	124	38.4
Adolescents 10-19	199	61.6
Gender		
Male	189	58.5
Female	134	41.5.
Residential Area		
Lahore	188	58.2
Out of Lahore	135	41.8
Family status		
Joint Family	161	49.9
Nuclear Family	162	50.2
Grade/ Level of education		
Pre-school	70	21.7
Primary (1-5 class)	58	18.0
Middle (6-8 class)	23	7.1
Secondary (9-10 class)	33	10.2
College	139	43.0
Family income in PKR		
4,000 to 20,000	4	1.2
20,000 to 70,000	298	92.2
More than 100,000	21	6.5

Out of total of 323 children, 274 (84.8%) avoided physical contact with people during the pandemic which was a major lifestyle change as shown in the figure below.

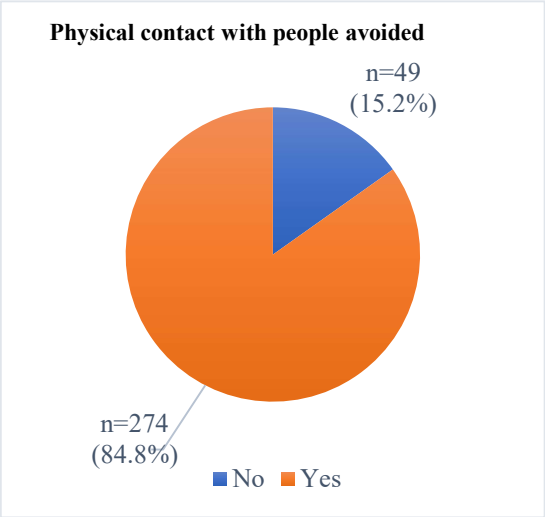

Figure 1: Avoided Physical contact with people (n=323)

Bivariate analysis of children and adolescents showed a significant association with consumption of fast food per week(p=0.031), fear of getting COVID-19 (p =0.041), feeling anxious due to pandemic (p=0.040) was found in behavior related to adolescent's lifestyle changes as compared to children. Also, a significant association was found in involvement in indoor physical activities per week(p=0.045) and using social media more than 7 hours per day (p= 0.042) in children's lifestyle as compared with adolescents.

Table-2: Bivariate analysis of Children and Adolescents with change in lifestyle

Variables	Children	Adolescent	p-value
Consumption of Fast Food per Week			
Never	43(34.9%)	70(35%)	**0.031***
1-2 times	42(34.1%)	80(40%)	
3-4 times	27(21.9%)	25(12.5%)	
More than 4 times	12(8.9%)	25(12.5%)	

Involvement in indoor physical activities per week			
Never	66(53.2%)	80(40.2%)	**0.045***
1-2 times	27(21.8%)	39(19.6%)	
3-4 times	18(14.5%)	33(16.6%)	
More than 4 times	13(10.4%)	47(23.6%)	
Feeling unhappy during lockdown			
Yes	51(41.1%)	103(51.8%)	0.063
No	73(58.9%)	96(46.7%)	
Afraid of getting covid-19 while going out of the house			
Yes	43(34.6%)	92(46.2%)	**0.041***
No	81(64.6%)	107(53.8%)	
Feeling anxious due to the pandemic			
Yes	40(32.3%)	87(43.7%)	**0.040***
No	84(67.7%)	112(56.3%)	
Facing trouble with online teaching			
Yes	82(66.1%)	113(56.8%)	0.095
No	42(33.9%)	86(43.2%)	
The use of social media increased during the pandemic (>7 hrs per day)			
Yes	105(84.6%)	149(74.9%)	**0.040***
No	19(15.4%)	50(25.1%)	

DISCUSSION

The negative effects of SARS-CoV-2 go beyond the infectious sickness. Indirect impacts of the COVID-19 pandemic pose substantial hazards to children and adolescents lifestyle behaviors. An imbalanced diet increases the risk of weight gain or nutritional inadequacies, sedentary lifestyle, lack of schooling, social isolation, and mental health issues.[16] Consumption of fast-food was higher in adolescents (12.5% of whom ate fast-food more than 4 times a week) as compared to children (8.9%) showing a significant difference with p-value of 0.031. Similarly in a multi-country international cross-sectional study frequent fast-food consumption was reported in 23% of children and 39% of adolescents. This may be due to the fact that adolescents have more access to junk food as compared to children who are dependent on their guardians.[17] In this study, significant difference (p-value 0.045) was observed as higher percentage of adolescents (23%) were involved in physical activities as compared to children (10%). The results of a study conducted in Switzerland highlighted a decrease in physical activity during the pandemic ranging between -10.8 min/day and -91 min/day in children and adolescents respectively.[18] Although 41% of children felt unhappy as compared to 52% of adolescents during pandemic but no significant difference was observed (p value 0.063). In another study conducted in Spain Children, in general, showed high resilience and capability to adapt to new situations during lockdown as compared to adolescents who felt unhappy.[19] Adolescents have significantly higher percentage of being afraid regarding catching Covid-19 infection if they go out as compared to children (0.041). Similarly, a study conducted in Netherlands stated that fear of getting covid-19 infection while going out was reported for (32%) children which was lower than that of adolescents (44%). [20] In this study, adolescents had significantly higher percentage (44%) of feeling anxious due to the pandemic as compared to children (32%) with a p-value of 0.04. Whereas in another study conducted in Spain, child and adolescent anxiety due to pandemic were reported to be 25.2% and 20.5%, respectively.[21]Although in the present study 66% of children faced trouble to learn via online teaching as compared to 57% of adolescents. Similarly in a research conducted in Greece, parents/caregivers reported that their children's performance deteriorated, while those of adolescents thought that online learning was beneficial.[22] In this study, Children (84.6%) have a significant higher percentage of use of social media as compared

to adolescents 75% (p-value 0.040). Similarly in a Canadian study, higher levels of TV or digital media time, video games and mobile usage was reported by both children's and adolescents' parents.[23] The strength of this study is that there is dearth of parental point of view to compare the impact of COVID-19 on children and adolescent's lifestyle behaviors whereas in depth analysis of variables was done.

LIMITATION

It is cross-sectional study so causation cannot be established.

CONCLUSION

Covid-19 had a significant effect on the lifestyle behaviors among children and adolescents. The study showed that factors such as consumption of fast food, fear of getting COVID-19 and feeling anxious due to pandemic were associated with behaviors related to adolescent's lifestyle changes whereas factors like indoor physical activities and excessive use of social media in children's lifestyle as compared with adolescents.

CONFLICT OF INTEREST

No Conflict of interest is declared by authors.

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None

AUTHOR'S CONTRIBUTIONS

ZHK: Methodology, Supervision, Review and Editing
MBA: Data Collection, writing Discussion and Conclusion
MSQ: Data Collection, writing Introduction and objective
MBA: Data Collection and Writing Results
MHA: Data Collection and Data Compilation

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Original Article

SPECTRUM OF CAUSES OF PRE-DONATION DEFERRALS BASED ON DONOR HISTORY QUESTIONNIARE AT JINNAH HOSPITAL, LAHORE

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ABSTRACT

Background: Pre-donation deferrals, determined through comprehensive donor history questionnaires, represent a crucial aspect of blood donation screening processes. Objective of this study was health care professionals can improve donor eligibility criteria to ensure the safety of blood transfusion recipients by investigating the various causes of these deferrals.

Materials and Methods: This cross-sectional study was conducted at the Blood Bank, Jinnah Hospital, Lahore, over a six-month period (August 2023 to January 2024). Data was collected from 550 donors aged, 18-65 years, both males and females through consecutive sampling after the informed consent through a structured questionnaire. It had with predefined questions which assess relevant information.

Results: Among 550 blood donors 537 were males (97.6%), and 13 were females (2.3%). The majority of donors were males in the age range of 21-40 years, with a mean age of 26 ± 1.2 years. A total of 65 donors (11.8%) were deferred from donating blood. Among the deferred donors, 28(43.1%) were temporarily deferred, while the remaining 37 (56.9%) were deferred permanently. The primary cause of deferral at our regional blood center was hepatitis C (27.6%), followed by hepatitis B (15.3%). In our study, besides Transfusion-Transmissible Infections (TTIs), the most common cause of deferral was recent blood donations (15.3%), followed by low hemoglobin levels (10.7%).

Conclusion: Blood donor deferral is a crucial step in donor selection and permanent deferrals causes being more prevalent in our setup demands adequate preventive strategies to address the prevailing causes of deferrals such as low hemoglobin levels and infections with HBV and HCV

Key Words: Donor deferral, Hepatitis C, Blood donations, Hemoglobin, Blood donor

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INTRODUCTION:

Blood safety is a major issue worldwide. The primary objective of blood transfusion services is to ensure the adequate availability of safe blood from healthy donors in order to supply needy patients with quality blood products on time.[1,2] In Pakistan, there are around 170 governmental and 450 private blood banks, with the majority of them attached to hospitals. Even in large cities, there is a significant blood shortage, with the supply falling short of more than half of the demand. However, the vast majority of blood donations in Pakistan are made as replacements by family or friends, with only a small contribution from volunteer blood donors.[3] Various blood donor screening processes contribute to blood transfusion safety and have been implemented in the United States, Europe, the United Kingdom, and Asia over the years. One of these is the deferral of high-risk

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donors before donation, which is determined by the risk assessment from the donor history questionnaire. [4] Blood donor eligibility criteria are based on research, informed medical opinions, and regulatory guidelines that aim to safeguard both blood donors and recipients from damage. The standards are also significant for blood safety (microbiological safety of blood); therefore, it is necessary to defer blood donors in order to prevent recipients from transfusion-transmitted illnesses. The recruitment and retention policies for blood donors are determined by the deferral trend in each area. [5] In general, there are four steps to this process. Knowledge-sharing about common infections that might spread through transfusions and other risks to a donor is part of the initial stage.[6] According to the procedure for selecting donors by transfusion services, only those who meet the criteria are eligible to donate blood. Donor history questionnaires (DHQ) are typically employed to detect potential hazards for transfusion-transmissible infectious diseases (TTI). Donors who pose higher risks are advised against donating. [7] Deferrals can be permanent or temporary. Permanent deferral applies to donors with long-term risks, such as transfusion-transmissible infections (TTIs). Temporary deferral occurs due to reversible factors like low hemoglobin. However, temporary deferrals may discourage future donations.[8],[9] Several studies have been conducted worldwide on the prevalence of blood deferral and its common causes. Some significant risk factors and medical circumstances leading to the exclusion of potential blood donors have been observed. According to these studies, the most prevalent causes of deferring include infectious diseases like HIV, hepatitis B and C, syphilis, and malaria. Additionally, several lifestyle factors, such as recent travel to certain countries, high-risk sexual conduct, and intravenous drug use, significantly affect deferral rates. [6] In Pakistan, there is not much literature on blood donor deferrals, perhaps due to a lack of awareness of the deferral criteria. Donor deferral information is not included in the annual data collection techniques; instead, the emphasis is on basic blood safety factors, such as the quantity and type of donations and screening procedures. [10] This research aimed to understand the underlying reasons for donor deferrals in our institute, providing insight into our health system's current procedures. To our knowledge, no previous study was conducted in the current study population during the same period.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted at the Blood Bank of Jinnah Hospital, Lahore, ERB number is ERB150/1/14-09-2023/S1 ERB dated 14-09-2023. Over a six-month period from August 2023 to January 2024. A total of 550 blood donors were included in the study using a non-probability consecutive sampling technique. The sample population consisted of adults aged between 18 and 60 years, including both male and female donors. However, individuals who did not provide informed consent were excluded from the study. Data collection was carried out using a structured questionnaire designed to obtain relevant information from blood donors. The questionnaire included predefined questions assessing medical history, lifestyle factors, and potential risk behaviors that could contribute to donor deferrals. Prior to participation, each donor was informed about the study objectives, and written informed consent was obtained to ensure ethical compliance and confidentiality. Following the completion of the questionnaire, participants underwent the standard blood donation screening procedure. Screening of blood products was performed using the Cobas c311 CHLIA-based assay, and jaundice was confirmed through physical examination and relevant history taking. During this process, donors were evaluated for medical conditions or risk factors that could lead to pre-donation deferral. All collected data were systematically recorded to maintain accuracy and consistency. The study aimed to assess both temporary and permanent deferrals, along with their underlying causes. By analyzing the data, this study aimed to identify the most common causes of donor

deferrals, providing valuable insights into improving donor eligibility criteria and ensuring the safety of blood transfusion recipients.

RESULTS

Among the 550 blood donors recruited for this study, a significant majority were male, constituting (97.6%) of the study population, while females accounted for only (2.3%). This gender disparity highlights a prevalent trend in blood donation demographics, reflecting a higher participation rate among males. Analysis of donor types revealed that the majority of participants, 520 (94.5%), were replacement donors, indicating a reliance on family or friends to replace blood used for medical purposes. Conversely, voluntary donors represented a smaller proportion, 30 (5.5%) of the total sample. Examination of blood group distribution among the donors unveiled interesting insights as highlighted by the tabular and graphical data provided below. The most prevalent blood type was 'B', with approximately 190 (34.5%) of the total donors belonging to this group. Following closely behind, individuals with blood type O constituted around 170 (30.9%) of the donors, while type A and type AB donors represented 150 (27.3%) and 40 (7.3%) of the donor pool, respectively. Additionally, analysis of Rh factor revealed that the majority of donors were Rh positive, accounting for 490 (89.1%) of the sample; whereas Rh negative donors comprised 60 (10.9%). (Table 1)

Out of the 550 blood donors enrolled in the study, a total of 65 donors (11.8%) were deferred from donating blood. Further analysis of donor demographics revealed a notable gender disparity within the study population. Of the total deferred donors, 56 were males, representing a substantial majority at 86.2%, while only 09 were females, comprising merely 13.8% of the study population. Among the deferred donors, 28 (43.1%) were temporarily deferred, while the remaining 37 (56.9%) were deferred permanently. (Table 2) Recent blood donations were the leading cause of temporary deferrals, 10 (15.3%). Following this, low hemoglobin levels were 7 donors (16.7%) and underweight 5 (7.6%). Other contributing factors included recent surgery, malaria, and ear piercings, each accounting for 3.0% of temporary deferrals, with two donors affected by each factor. (Table 3)

Table-1: Blood group distribution among study population

Blood Group	Frequency (n)	Percentage (%)
A	150	27.3
B	190	34.5
AB	40	7.3
O	170	30
Rh –Positive	490	89
Rh- Negative	60	11

Table-2: Distribution of donor deferral

Donor Deferrals	Frequency (n)	Percentage (%)
Permanent Deferred	37	56.9
Temporary Deferred	28	43.1
Total Deferred Donors	65	11.8

Table-3: Causes of permanent deferrals

Cause	Frequency (n)	Percentage (%)
HCV	18	27.6
HBV	10	15.3
Syphilis	5	7.6
Jaundice	4	6.1

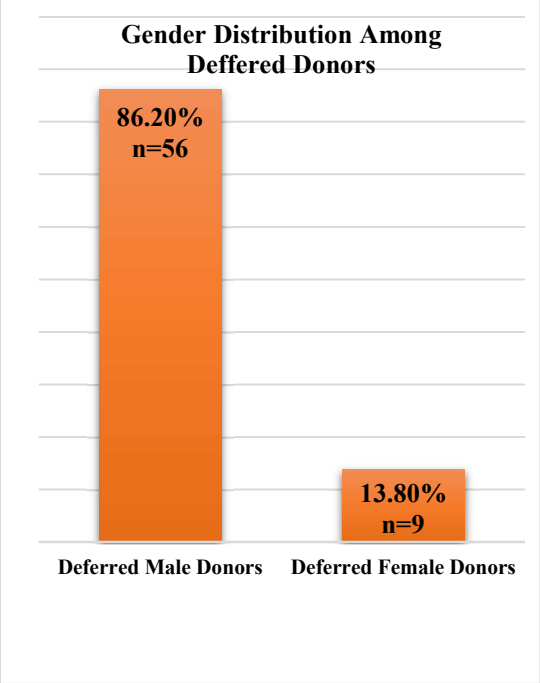

Figure 1; Gender Distribution Among Deferred Donors

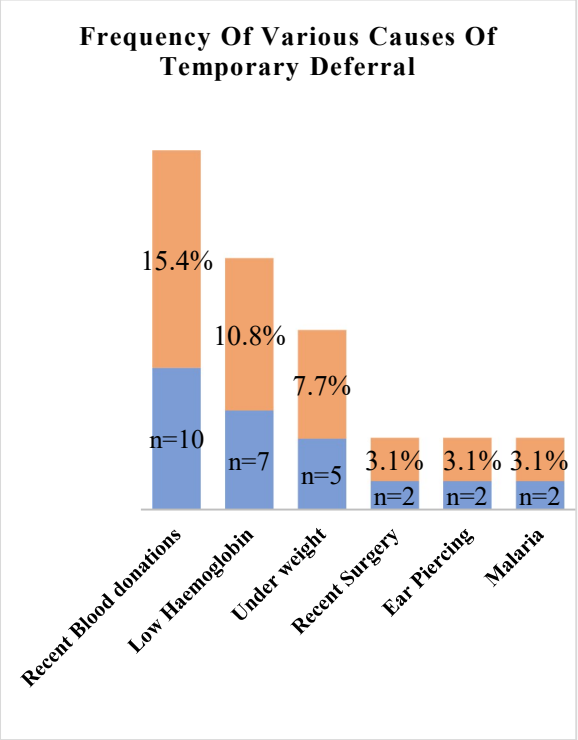

Figure –2: Frequency of various causes of temporary deferral

DISCUSSION

Selecting a blood donor is a crucial step in the transfusion process, involving multiple checks to ensure the safety of both donors and recipients. This process typically includes four key steps: educating donors about transfusion-related risks, an interview with a qualified healthcare professional, completion of a health questionnaire, and a thorough health evaluation through physical and laboratory assessments. Some deferrals are temporary, depending on the donor's condition. Our study aimed to assess the prevalence of donor deferrals and identify the most common reasons for them. The study found a significant male predominance in blood donation, with males comprising 97.6% of donors and females only 2.3%, aligning with previous research and highlighting a consistent gender disparity across regions. This mirrors the findings of Kujur P, et al.[11],[12] The findings emphasize the need for targeted initiatives to boost female participation in blood donation by addressing logistical barriers and misconceptions. Tailored awareness campaigns and educational programs can help close the gender gap and create a more inclusive donor pool. The study revealed that 94.5% of donors were replacement donors, while only 5.5% were voluntary, closely aligning with Khurram et al.[13] findings (93.8% replacement vs. 6.2% voluntary). This heavy reliance on replacement donors raises concerns about the sustainability and inclusivity of blood donation programs, highlighting the need for strategies to encourage voluntary donations. The higher proportion of voluntary donors (22.6%) in some studies, [14] compared to earlier findings, suggests successful outreach efforts or a societal shift toward supporting voluntary donations, highlighting potential progress in donor composition over time. The deferral rate in this study (11.5%) aligns with findings by Elsafi et al.[14] (11.7%) and falls within the range reported globally. Other studies show varying rates: Okoroiwu and Asemota[15] (8.69%), Khurram et al. [13] (12.2%), Saba et al.[3] (6.37%), and Malhotra and Negi[12] (16%). Internationally, rates are comparable to France[17] (10.8%) but lower than the U.S. (12.8%–15.6%)[35-42], Japan (14%)[26], Singapore

(14.4%)[18], Turkey (14.6%)[13], and Nigeria (16%)[10]. This variability reflects differences in screening processes and donor characteristics. The current study found a 56.9% permanent deferral rate, aligning with Saba et al. [3] (55.5%) and highlighting a significant challenge in blood donation efforts.[3] However, rates vary widely across studies, such as Kujur and Tiwari (9.8%) and Okoroiwu and Asemota (68.9%), likely due to regional differences in healthcare standards, prevalent medical conditions, and regulatory frameworks.[8] Temporary deferral rates also exhibit considerable diversity among studies. Our study reported a temporary deferral rate of (43.1%), aligning closely with the findings of Saba et al. [3] (44.4%). However, Elsafi[14] and Khurram et al. [13] reported notably lower temporary deferral rates of 11.7% and 11.1%, respectively, while Malhotra and Negi and Kujur and Tiwari reported substantially higher rates at (88%) and (90.1%), respectively. These discrepancies in temporary deferral rates may arise from variations in criteria for temporary deferral, such as recent travel to regions with prevalent diseases like malaria or the presence of medical conditions necessitating temporary deferral. The current study found an HCV prevalence of 27.6%, closely aligning with Saba et al. (21.5%) but differing from Okoroiwu and Asemota (18.9%) and Kujur and Tiwari (0.1%). These variations may stem from differences in screening assay sensitivity and regional HCV prevalence. Similarly, HBV prevalence rates varied, with the study reporting 15.3%, compared to Okoroiwu and Asemota (31.7%) and Saba et al. [3] (30.3%), likely due to geographical disparities in HBV prevalence and vaccine coverage.[3,8] The current study found a low hemoglobin (Hb) deferral rate of 10.7%, consistent with Saba et al. (8.2%) but lower than Elsafi[14] (14.8%), Kujur and Tiwari (15.9%), Okoroiwu and Asemota (21.9%), Khurram et al.[13] (30.7%), and Malhotra and Negi[12] (43.3%). These variations highlight the widespread issue of low Hb as a leading cause of deferral, emphasizing the need for preventive measures and treatment strategies in donor recruitment efforts. Elsafi[14] reported a 4.8% deferral rate due to recent donations, while Malhotra and Negi[12] noted a lower rate of 1.2%. These variations underscore the need for further research to address the demand-driven nature of blood donation systems and improve donor management strategies. The varying malaria-related deferral rates—3.0% in the current study compared to 0.6% Saba et al.[3] and 0.79% (Okoroiwu and Asemota)—highlight the impact of geographical location and malaria prevalence on donor eligibility. Seasonal transmission patterns, control measures, and population demographics further contribute to these regional disparities, emphasizing the complex factors influencing deferral practices. The need for continuous surveillance and screening is underscored by the wide variation in syphilis prevalence and deferral rates, which range from 7.6% in the current study to 14.1% (Saba et al.) and 0.15% (Okoroiwu and Asemota). These variations are probably caused by changes in population demographics, screening procedures, and regional epidemiological factors.

This study of pre-donation deferrals, aligns with global trends and highlights several crucial areas for enhancement in donor screening and education. The implementation of the donor history questionnaire (DHQ) is crucial for screening ineligible donors before blood donation, hence ensuring safety for both the donor and the recipient. This study aligns with the research undertaken by Al Shaer et al. (2017),[15] which analyzed donor deferral trends in Dubai, revealing that a significant number of temporary deferrals is attributable to low hemoglobin levels and recent medication use. These were also the most common causes in our pool of donors which is why health education is necessary to potential donors especially in the low- and middle-income countries. Another relevant aspect, which was based on the findings of Alsalmi et al. (2019),[16] showed that blood donation behavior was significantly influenced by knowledge, attitude, and practice (KAP) in Saudi Arabian health profession.[13] In this regard, it may be

argued that once particular awareness efforts are conducted among the population, more deferral cases can be avoided and that, from a long-term viewpoint, donor retention will improve overall.

Misconceptions about the reasons behind deferral may subsequently discourage the donor. In order to enhance blood safety, Gillet Neijens (2018)[17] underlined the importance of carefully evaluating donor questionnaires and deferral rates. Their results are consistent with our study's use of structured DHQs to narrow down important deferral factors, namely recent donations and hepatitis C. This demonstrates the value of routine questionnaire audits to improve the precision and reliability of donor screening. Comparing our study to the experience of the tertiary care hospital in Pakistan, as described by Khalid et al. (2018)[18], we found that anemia, underweight, and recent illnesses were the main reasons for temporarily delaying care. Although there are regional differences, these similarities further support the idea that hospital-based blood banks' donor deferral patterns typically center on a comparable spectrum of non-preventive health-related issues. According to the study by Neugebauer et al. (2022),[19] DHQs conducted before the donation visit are a very effective strategy to improve blood safety because they provide donors the time they need to accurately disclose and self-defer. The creation of a system to submit the DHQ prior to the appointment should be the next step of intervention in order to minimize last-minute losses in terms of accuracy and quality. The amount of adequate information in our current approach of completing the DHQ on the same care day may be relatively low. Offer geld and Heiden (2017) reported the problem of developing a universal, but culturally adjustable DHQ in Germany. In the same regard, our research offers a revision to existing DHQ at Jinnah hospital to display local deferral patterns, so as to promote an effective screening and an improved donor retention by using culturally authentic questions.[20] The discussion highlights the complexity of blood donation eligibility criteria, with studies like Malhotra and Negi and Elsafi identifying medication usage (e.g., antiplatelet drugs, anticoagulants, aspirin) as a significant deferral cause.[12,14] This underscores the need for thorough medical screening to ensure donor safety. While our study validates the efficacy of our screening methods, comparative analysis reveals geographical variations in deferral causes, offering insights to optimize blood donation protocols. Further research and collaboration among blood donation organizations are essential to refine screening practices and improve donor management.

CONCLUSION

The study identified a significant gender disparity in blood donation, with 97.6% male donors, highlighting the need for targeted female recruitment. Hepatitis C was the leading cause of deferral, emphasizing the challenge of transfusion-transmissible infections. Recent donations and low hemoglobin levels, particularly in females, also contributed to deferrals. These findings underscore the need for improved screening, donor management, and recruitment strategies to ensure a safer and more sustainable blood supply

LIMITATION OF THE STUDY

This study's findings are limited by a sample size of 550 donors, which may not fully represent the broader population. The significant gender disparity, with a majority of male donors, could introduce bias in deferral reasons. Conducted at a single regional blood center, the results may not be generalizable to other locations with different donation practices. The study's temporal scope does not account for changes in donor behaviors over time. Additionally, variations in screening protocols across different centers may affect data consistency and interpretation.

CONFLICT OF INTEREST

No conflict of interest is declared by authors.

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None

AUTHOR'S CONTRIBUTIONS

TF: Concept, Supervision of Data Collection
UF: Manuscript writing and Data Collection
HAS: Manuscript writing and Data Collection
SB: Revision of Manuscript
MN: Methodology and Data Analysis
RN: Methodology and Data Analysis

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Original Article

PREVALENCE OF SACROILIAC JOINT DYSFUNCTION AMONG IT STUDENTS: A CROSS-SECTIONAL STUDY

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Abstract:

Background: Sacroiliac joint dysfunction (SIJD) is one of the most frequent causes of musculoskeletal pain that IT students are primarily exposed to due to bounded sitting postures which lead to tension, dysfunction and pain in the sacroiliac joint. The objective of this study is to establish the prevalence of SIJD among the IT students and to analyse its association between gender.

Material and Methods: A cross-sectional survey was conducted among 85 IT students of UET and ILM College who reported falling at least once in the past year or seeking musculoskeletal treatment. NPRS, DSIJQ, FABER, thigh thrust, and distraction tests were utilized in the overall assessment. SPSS 25 was used for performing the statistical analysis.

Results: The overall prevalence of SIJD among IT students was 43.8%; of them 68.2% had positive FABER test, 25.9% thigh thrust test, and 17.6% distraction test. Women were slightly more at risk than men due to conditions such as movement disorders, sitting for long hours, and poor ergonomic. In addition, a strong positive correlation with > 45 working hours/week and SIJ pain and lifting weights made it worse.

Conclusion: The current research revealed that 43.8% of the IT students were found to have SIJD related to the risk factors including improper postures while sitting, sitting for long duration and working for long duration. Other areas that need intervention for the prevention of the SIJD include ergonomic problems proportion and position problems.

Keywords: Sacroiliac joint dysfunction, Denver SIJ Dysfunction Questionnaire, IT students

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INTRODUCTION

Sacroiliac joint dysfunction (SIJD) is defined as a pathologic variation in the amounts of movement that produce painful in the sacroiliac joint, whether due to hypermobility or hypomobility.[1] Also known as SI joint dysfunction, strain, or inflammation, SIJD can result from arthritis, joint instability, joint stiffness, or ligament laxity.[2] This is the pathos-mechanical dysfunction characterized by the abnormal biomechanics of the joint rather than the pathological processes.[3] It has features of both synovial and amphiarthrotic joints: it contains synovial fluid and articular cartilage and lacks a synovial cavity.[4] It is involved in 15 to 30% of low back pain incidences but poorly diagnosed and treated.[5] Higher incidence is reported in females mainly due to pregnancy, lack of physical activity or after lumbar fusion surgeries, whereby SIJ degeneration occurs in 75% of patients within five years.[6] Some of the

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risk factors include abnormal walking patterns, unequal leg length, scoliosis and strain on the structures involved in the activity.[7] Sedentary lifestyle and kyphotic posturing results in added stress on the sacrum and SIJ joint therefore increasing the development of pain.[8] It is manifested by low back pain that may be unilateral or bilateral, pain in both buttocks and hips, and instability. Postural changes such as sitting, standing, climbing steps, and bending make the symptoms worse and women are affected more especially during menstruation.[9] Diagnostic strategies include pain assessment, provocative testing, and, in some cases, local anesthetic SI joint injections.[10] Sacroiliac joint testing may also be used to diagnose SI joint problems. Some of the tests included in provocation tests were Gansler's Test, Faber's Test, Thigh Thrust Test, SI Compression Test and Sacroiliac Joint Distraction Test. The sacroiliac joint was engaged when pain was experienced in three or more tests.[7] Lower quarters tests used were Gillet's test for sacroiliac joint dysfunction.[11] Conservative treatment possibilities include NSAIDs, corticosteroid injections, manual therapy and core muscle strengthening exercises. In some special circumstances, the following surgical procedures may be applied, such as sacroiliac joint fusion.[12,13] Because the general effects of SIJD are severe, early detection and appropriate treatment are crucial. Yan et al. (2024) pointed out that pain reduction and functional improvement can be obtained from the combined treatment that includes mobilization and mediations.[14] Moreover, Naveed et al., (2024) established that LBP and SIJD were prevailing among gynecologists due to poor posture caused by sitting and prolonged stooping at work.[11] In a similar way, Bashir et al. (2024) observed fewer school teachers with SIJD and concluded that there could be various causes other than SIJD, which leads to LBP among school teachers.[15] Siva Kumar et al. (2021) concluded regarding the impacts of SIJD that 61% of medical students experienced LBP due to SIJD because of the adverse consequences of prolonged sitting.[7] On the other hand, Arslan et al., (2021) established a 46.71% prevalence SIJD among women in Lahore significantly higher among married ladies, due to hormonal changes during childbirth and sedentary life styles.[16] Ramirez et al. (2015) found that SIJD was responsible for 15-30% of patients with idiopathic LBP. In provocation tests, around 40% people had SIJD and FABER and Sacral Thrust tests were more valid.[17] On the contrary, Kiil et al. (2022) distinguished abnormal SIJ structures involving females only through the use of CT and MRI and, thereby, pointed towards the effects of morphological changes on the incidence rates of SIJD.[18] Similarly, Krishnamoorthy et al. (2019) have correlated changes in SIJD with poor prognosis in FAIS thus emphasizing the role of imaging.[19] However, Eno et al. (2015) noted that SIJD degeneration is 30.5% prevalent among asymptomatic normal individuals that is further linked with advancing age.[20] Several researchers have explored the prevalence of SIJD in different working groups with a focus on health-wise professional and peripatetic students, pregnant women, cyclists, and rowers whereas not much research has been conducted on IT students. IT students are at higher risks of experiencing low back pain which is an indication of SIJD since they spend most of their time in front of computers with bad postural manners. The purpose of this research was to assess the incidence of this type of SIJD among IT students, discuss the measures of improving posture, the methods of recognizing the first signs of the problem, and encouraging the practice of physical activities. They focused on physiotherapy, as well as offering pain relief through medication and massage, and reducing a worker's risk of developing SIJD and enhancing their quality of life through supporting ergonomic practices, exercise, and maintaining an appropriate work schedule.

MATERIAL AND METHODS

The current cross-sectional study was conducted after seeking the ethical approval from the Ethical Committee of the Institute of

Leadership and Management. Sample size of 85 participants was calculated with RAO software in order to collect the data, non-purposive convenient sampling was applied from the institutions such as University of Engineering and Technology (UET), Institute of Leadership and Management (ILM), National College of Business Administration & Economics (NCB&E), Institute of Professional and Learning (IPL), GTECH sources etc. The data collection took six months. Based on criteria for sample selection, participants included college students, 17 to 27 years of age, who did not suffer a fall recently were taking medications that are related to musculoskeletal health issues, without structural abnormalities or congenital diseases.[7] The exclusion criteria also prevented the participation of patients with previous fractures, pregnancy, previous trauma, disc-related issues, cancer, and spondyloarthropathies.

The sample included only participants who met the study requirements.[7] Each participant provided an informed consent to ensure the study's authenticity. The participants were clearly informed on the study's aim and the use of the questionnaires that they were to complete. Participants completed a self-administered questionnaire, which provided information about demographic characteristics, and two standardized instruments; the Denver Sacroiliac Joint Questionnaire (DSIJQ) and the Numeric Pain Rating Scale (NPRS).[21] The DSIJQ is a reliable and valid scale to measure sacroiliac joint disability as found by ICC, 0.87 Cronbach alpha 0.842, content validity (<30% of floor/ceiling effects), r =0.89.Significant correlations were obtained with the Timed Up and-Go with correlation coefficient of 0.53, P = 0.008 and the 5 Minute walk with a correlation coefficient of - 0.52, P = 0.009 (22).

Each participant was informed about the study's objectives and the purpose of the questionnaires. The results were analyzed using the Statistical Package for Social Science (SPSS) to guarantee a precise statistical estimation in mean and frequency (%) were described. Further, cross tabulation and chi square analysis between two variables were also performed.

RESULTS

Table 1 shows the mean age of the participants to be 21.88 ± 2.73 years; the age varied from 17 to 27 years. In regards to gender the subjects were rather balanced with 43 females, representing 50.6% of the sample, and 42 males, 49.4%. The most commonly positive diagnostic tests are FABER, and of the 85 students taking the tests, 58 (68.2%) yielded positive results while 22 (25.9%) were positive for Thigh Thrust and 15 (17.6%) for Distraction. NPRS scale for pain intensity yielded that 40 students (47.1%) had mild pain, 28 (32.9%) had moderate pain and 17 (20.0%) students had severe pain. From the above DSIJQ analysis it can be noted that while 29 of the students (34.1%) used cushions or pads for elongated sitting, 44 students 51.8% complained of experiencing pain when standing from a chair after work.

Table 1: Frequency Distribution of Outcome Variables

Variable		Frequency (n)	Percentage (%)
Gender			
Female		43	50.6%
Male		42	49.4%
Diagnostic Test			
Faber's Test	Positive	58	68.2%
	Negative	27	31.8%
Thigh Thrust Test	Positive	22	25.9%
	Negative	63	74.1%
Distraction Test	Positive	15	17.6%
	Negative	70	82.4%
Numeric Pain Rating Scale			
(0-3) Mild pain		40	47.1%
(4-6) Moderate pain		28	32.9%
(7-10) sever pain		17	20%

Data presented in Table 2 shows that 34 students (40.0%) denied any form of pain while walking on any surface of the building, 39 students (45/9%) denied any form of pain while climbing stairs. Further, 48 (56.5%) had no car transfer pain/comfort and, 46 (54.1%) slight pain for car bending, kneeling, and squatting. Students complained of pain when lifting objects to be 38 (44.7%) whereas 33 of them complained of sleep disturbances due to pain. Importantly, 38 students (44.7%) demonstrated a normal degree of stability of the sacroiliac joint. The results concerning the gender and diagnostic tests were shown in the Table 3. There were no correlations between gender and the results of FABER's test, Thigh Trust test, and Distraction test as the p-values of 1.00, 0.805, and 0.407 respectively suggest.

Table 2: Denver Sacroiliac Joint Questionnaire Frequency of participants

Question	Frequency (n)	Percentage (%)
Affect your daily life		
I can always sit in any chair for longer periods of time.	22	25.9%
I can always sit for longer period of time on a chair with a pad or cushion.	29	34.1%
I can sit for long periods of time but I have to change positions frequently	25	29.4%
I cannot sit for more than an hour due to pain in sacroiliac joint.	9	10.6%
Standing up		
There is no pain in the sacroiliac joint area	24	28.2%
I have some pain in the sacroiliac joint area, but I can stand up from chair normally.	44	51.8%
I have severe pain in the sacroiliac joint area, so I have to get up from chair very slowly.	15	17.6%
I can't get up a chair without help because of the pain in my sacroiliac joint.	2	2.4%
Walking		
Can walk long distances on any surfaces.	34	40%
I have pain in my sacroiliac joint, so I try to walk on flat surfaces.	25	29.4%
Due to pain in the sacroiliac joint ,I am unable to walk more than 1.5 kilometers.	17	20%
I cannot walk more than 100 m due to pain my sacroiliac joint.	9	10.6%
Getting up and down stairs		
There is no pain in the sacroiliac joint area and I can go up and down stairs.	30	35.3%
I have pain in the sacroiliac joint area, but I can go up and down stairs.	39	45.9%
Because of pain in the sacroiliac joint, I have to go up and down slowly.	10	11.8%
Handrails are required due to pain in the sacroiliac joint.	6	7.1%
Getting in and out from the car		
There is no pain in the sacroiliac joint area and I can get in and out from car normally.	48	56.5%
I have some pain in my sacroiliac joint but I can get in and out of the car normally.	28	32.9%
I have severe pain in the sacroiliac joint area but I can get in and out of the car normally.	8	9.4%
I have quite severe pain in the sacroiliac joint area, but with assistance I am able to get in and out of car.	1	1.2%
Bending, Kneeling and squatting		
I can bend kneel and squat without pain in the sacroiliac joint area.	24	28.2%

I have slight pain in the sacroiliac joint but I can bend, kneel and squat.	46	54.1%
I have some pain in the sacroiliac joint but I can bend, kneel and squat.	8	9.4%
I have severe pain in the sacroiliac joint but I can bend, kneel and squat.	7	8.2%
Lifting		
No pain in the sacroiliac joint area and able to lift heavy objects.	17	20%
Pain in the sacroiliac joint area but able to lift heavy objects.	38	44.7%
I have pain in the sacroiliac joint, but I can lift them from waist height such as on a table.	17	20%
I have pain in the sacroiliac joint area and only lift very light objects.	12	14.1%
I cannot lift or carry anything because of pain in sacroiliac joint area.	1	1.2%
Work, Social work		
I can go to work, do house work	12	14.1%
slight pain in the sacroiliac joint area, but I can do still work,	37	43.5%
some pain in the sacroiliac joint area during work.	26	30.6%
severe pain in the sacroiliac joint area during work.	10	11.8%
Sleep		
I don't wake up because of pain in the sacroiliac joint.	30	35.3%
Sometimes, wake up because of pain in sacroiliac joint.	33	38.8%
I wake up because of pain in my sacroiliac joint, but I can sleep about 8 hours a night.	8	9.4%
I can't sleep more than 6 hours due to pain in my sacroiliac joint	10	11.8%
I can't sleep more than 4 hours due to pain in my sacroiliac joint.	4	4.7%
SIJ Stability		
Sacroiliac joint doesn't fell unstable	38	44.7%
I get overworked, I feel discomfort in the sacroiliac joint.	31	36.5%
I bend or twist my body, I feel like the sacroiliac joint is loose or out of place.	11	12.9%
I walk or stand, I feel as if my sacroiliac joint is loosening or popping out.	5	5.9%

Table 3: Association of Gender distribution with Diagnostic Tests

Diagnostic Test	Gender		Total 85	*p*-value
	Male 42	Female 43		
Faber Test				
Positive	29	29	58	1.00
Negative	13	14	27	
TTT				
Positive	10	12	22	0.805
Negative	32	31	42	
Distraction Test				
Positive	9	6	15	0.407
Negative	33	37	70	

DISCUSSION:

Sacroiliac Joint Dysfunction (SIJD) has emerged as a significant concern among IT students, primarily due to prolonged sitting in static postures. This research investigated the prevalence of SIJD in this population using the Denver Sacroiliac Joint Questionnaire (DSIJQ) and the Numeric Pain Rating Scale (NPRS), involving both male and female participants. Findings indicated that females were slightly more prone to SIJD than males, potentially due to anatomical differences, such as a shallower pelvis, hormonal fluctuations, and flexible ligaments. This observation aligns with Sivakumar et al. (2021), who reported a

higher susceptibility in women (59%) compared to men (41%), linked to prolonged sitting and faulty postures.[7] Similarly, Naveed et al. (2024) highlighted an increased risk of SIJD among female gynecologists aged 35–40.[11] whereas Petrie et al. (2023) suggested an equal prevalence across genders, diverging from the current study's findings that females, irrespective of age, exhibited greater vulnerability.[23] The study demonstrated that the FABER's test and Thigh Thrust test were particularly effective in diagnosing SIJD, with 68.2% of participants testing positive on FABER's and 25.9% on Thigh Thrust. These findings echo Ramirez et al. (2015), who identified FABER's and Sacral Thrust tests as the most reliable diagnostic tools, with a significant proportion of individuals testing positive for SIJD using these methods.[17] Mikhail et al. (2021) emphasized the predictive value of three or more positive provocation tests in diagnosing SIJD, a conclusion partially supported by the current study as FABER test produce more authentic results in diagnosing SIJD.[3] However, Buchanan et al. (2021) advocated for the SI Compression and Thigh Thrust tests as more reliable, presenting a contrast in diagnostic emphasis. Moreover, distraction tests yielded lower sensitivity (60%) but higher specificity (81%), [6] consistent with Sivakumar et al. (2021), who integrated this test into their diagnostic protocol.[7] In contrast to current study, Fatima et al. (2021) found no significant association between NPRS scores and distraction test results.[24] The repetitive activities associated with IT student lifestyles, including prolonged sitting, bending, lifting, and twisting, contribute to SIJD-related discomfort. These faulty postures compress musculoskeletal structures, resulting in pain and dysfunction. The DSIJQ results revealed that 34.1% of students experienced difficulty sitting, 45.9% reported pain while climbing stairs, and 44.7% faced discomfort while lifting objects. Notably, 38.8% of participants experienced sleep disturbances due to pain, while the SI joint was stable in 44.7%. These findings align with Patel et al. (2023) and Sayed et al. (2024), who validated the DSIJQ as an effective tool for assessing SIJD and its impact on daily activities.[22,25] In contrast, Sivakumar et al. (2021) employed the Nordic Musculoskeletal Questionnaire alongside a demographic survey, offering an alternative assessment approach.[7] Provocation tests were evaluated for their diagnostic reliability, with FABER's test showing moderate sensitivity (71%) and specificity (75%), as supported by Telli et al. (2020) (26). The Thigh Thrust test, also referred to as the posterior shear test, demonstrated sensitivity of 88% and specificity of 69%, consistent with Mekhail (2021).[3] However, Gartenberg et al. (2021) critiqued the Thigh Thrust test for its limited diagnostic precision. The distraction test was less clinically robust but provided value when used within test clusters[1] Research by Bashir et al. (2024) corroborated these findings, indicating prolonged sitting as a critical factor for SIJD in other sedentary professions, while Fatima et al. (2024) found no significant correlation between NPRS scores and distraction test outcomes.[15,24] The study highlighted a 43.8% overall prevalence of SIJD among participants, aligning with Sivakumar et al. (2021), who estimated SIJ dysfunction as a contributor to 15–30% of low back pain cases.[7] While this research underscores the role of SIJD as a prevalent musculoskeletal concern, it also calls for further investigations integrating diverse diagnostic methods and extended observation periods to enhance understanding and management strategies. Despite these, the present study contains some limitations that may affect the generalization and scope of the findings. A particularly important point is that the information about the duration of the sitting and work history of the students were not obtained. Such a limitation poses a challenge in determining the progressive nature of sacroiliac joint dysfunction in patients or the changes that occur when such a condition is subjected to an extended period of sitting. More than that, the study did not

discover risk factors that may be linked with raised possibility of growing of SIJD among IT students. To overcome such limitations in future research, it is suggested to include a better examination of sitting duration and work patterns among the IT students who rely on laptops or computers. This approach would increase the knowledge of the progression of SIJD as well as increase the externality of the study. In addition, future research should seek to establish more vital risk indicators associated with the development of SIJD and compare them with the onset of pain experienced by this population. Such improvements would generate better data to prevent and control SIJD among IT students.

CONCLUSION

The study concluded that Sacroiliac joint dysfunction is 43.8% prevalent among IT students that is highly independent of the gender difference.

CONFLICT OF INTEREST

No conflict of interest is declared by authors**.**

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None

AUTHOR'S CONTRIBUTIONS

AU: Concept, Article Writing
SAR: Concept and Data Collection
RH: Technical Support, Critical approval
SS: Data Analysis, Critical approval

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Original Article

AWARENESS, ATTITUDE & KNOWLEDGE REGARDING RESEARCH METHODOLOGY AMONG UNDERGRADUATE MEDICAL STUDENTS: A SINGLE INSTITUTE, DESCRIPTIVE CROSS-SECTIONAL STUDY

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Abstract

Background: In the medical field, research is essential; without the knowledge and abilities to do research, one cannot progress in their career. Increased postgraduate training enrolment, greater employability, and increased output in postgraduate research are all results of research exposure. The objective of the study was to evaluate their attitude, determine their level of awareness, and comprehend their understanding of research methods.

Material and Methods: Students from all five academic years of MBBS participated in this cross-sectional study, which was carried out at a medical college in Lahore. Convenience sampling was used to choose the 250 study participants, and a questionnaire-based survey was used to gather data. The awareness, attitude, and understanding of the study approach were evaluated using the various criteria. Frequency tables, bar graphs, pie charts, and line graphs were used to display data.

Results: The result showed due to Student's perception of their limited exposure to research, students in their first two years of study lacked awareness. Because just 34% of students are currently involved in any research projects and fewer than half have actual research experience, research skills grow with exposure to research. while over 80% of them wish to take part in research initiatives.

Conclusions: Medical students at the undergraduate level are aware of the advantages of research experience, but they also require a practical grasp of the research methodology. Undergraduate students may not have many opportunities to build their research talents, but they may hone their abilities with the support of their institute's staff and resources thanks to the research-oriented atmosphere.

Key Words: undergraduate; awareness; research methodology; attitude; knowledge.

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INTRODUCTION

Medical professionals have always been either scientists or do research to stay afloat in the rapidly expanding medical college landscape.[1] Healthcare policies have failed in the past because of a lack of evidence-based and Practical policymaking, including research. Early research involvement in medical school might introduce students to research, spark their interest, and encourage more students to choose careers as physician-scientists.[2] Conducting high-quality research depends on a number of factors, including financing, training, and advice from mentors who are focused on research. Regretfully, medical students at even Karachi's top medical school report having just a rudimentary understanding of research and a moderate interest in this area of medicine, and they face obstacles due to a lack of good

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mentoring.[1] Clinical professionals must use the best available information to support their decisions about the best treatment for their patients or populations in order to practice evidence-based medicine.[3] Due to the fierce rivalry for training positions, research experience—especially if it is demonstrated through peer-reviewed publications—is a valuable asset for medical students in particular. It can be challenging to provide undergraduate medical education with chances for the development of varied and effective research abilities.[3]

Throughout their careers, healthcare professionals have a difficult time staying up to date on the latest developments in clinical practice. For every practicing physician, the concepts of scientific methodology, critical evaluation, and evidence-based medicine (EBM) are crucial in addressing these issues. These programs, which usually involve supervised study in a particular topic area, might be optional alternatives or mandatory as part of the syllabus.[4] All pupils in the UK are exposed to research concepts through the student-selected components (SSC) curriculum.[5]

Tomorrows Doctors, the Scottish Deans Curriculum group, and the guide to Good Medical Practice USA have all strongly recommended that undergraduate medical students develop research-specific skills in addition to transferable skills like communication, teamwork, time management, and critical thinking.[5] Numerous causes, including rising educational costs, greater earnings from clinical work, and shrinking research resources due to growing rivalry.

According to the curriculum of the University of Health Sciences, Lahore, student research projects are required in the fourth year of MBBS and fall within the purview of the department of community medicine. In the meanwhile, Continental Medical College is working hard to extend its research projects to all MBBS classes so that graduates can be prepared with research knowledge and adhere to evidence-based practice. Before formally introducing research instruction, it only makes sense to first gauge their awareness level, attitude, and knowledge of research technique. The objective of this research is to assess medical students' understanding of research at the undergraduate level, to gauge how they feel about conducting research and to gauge their level of expertise in research methods.

MATERIAL AND METHODS

Institutional Review Board (IRB) of Continental Medical College, Pakistan approved the study with reference # 38/IRB/CMC, duration of study was 6 months. This cross-sectional, descriptive study was carried out at Lahore's Continental Medical College, undergraduate medical students were among the study participants. Following institutional review board and ethics committee permission, the sample size was determined using the literature using the formula:[9] with a total of 250 medical students on the roll, with a 95% confidence level, a 50% chance of success, and 0.05 error margins, to ensure consistency in the data for comparison, a non-probability convenience sampling approach was used to raise the sample, with 50 students from each class.

Medical students in their first through last year of study were included. Those who declined to participate or did not show up on the day of the poll were not included. The questionnaire was a structured, self-administered tool designed to gather quantitative data using a series of close-ended questions. It was divided into key sections: Demographics: gender, age group, year of MBBS, and previous qualifications, Understanding & Attitude: Assesses the students' perception of research and its importance in medical education, awareness & Exposure: Evaluates knowledge about research

practices in their institution and habits around reading medical journals, Interest & Involvement: Gauges willingness to participate in research and the preferred role in a project, Motivation & Self-Assessment: Uses Likert-scale ratings to measure students' motivation and confidence in various research-related skills, the format is designed to facilitate easy analysis and interpretation, with the aim of assessing overall research awareness and preparedness among medical students.

A printed questionnaire created in light of the literature and authorized by the IRB was used to gather data after the individuals gave their consent. We evaluated their knowledge using a five-point Likert scale: 1 meant they had never heard of it, 2 meant they were not confident, 3 meant they were relatively confident, 4 meant they were highly confident, and 5 meant they were extremely confident.

The five questions were straightforward yes/no questions that asked about their prior or present exposure to research. For ease of comprehension, the data were then recoded into three groups: 1–25 = bad knowledge, 26–35 = fair knowledge, and 36–50 = high knowledge. The software SPSS version 25 was used for data analysis. Frequencies and percentages were used to display the data.

RESULTS

The study included a total of 250 participants, comprising 140 males (56%) and 110 females (44%). The age distribution was 17-20 years: 128 participants (51%), 21-23 years: 103 participants (41%) and 24-29 years: were 19 participants (8%). When students were asked about their understanding of the term research, 155 (62%) said it's gathering information and testing hypotheses. Overall, 195 (78%) students feel it's important for them to know about the research methodology Only 80 (32%) students were of the opinion that their current exposure to research was adequate. (Figure 1).

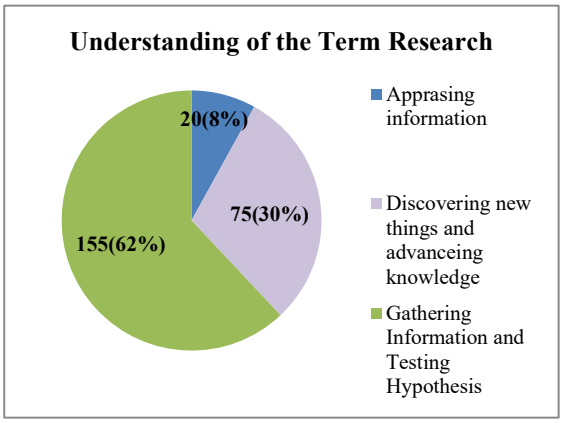

Figure 1: Understanding of the Term Research

When asked about the year of mandatory research where students must complete a research project either independently or in a group to pass the final professional exam of community medicine, 155 (62%) students knew the right answer that 4th-year MBBS is the mandatory research year. Meanwhile, only 105 (42%) students knew about ongoing college research projects Most unaware students were from the first two years of MBBS. Only 99 (39.6%) students said that they have a habit of reading medical journals. Out of the total 99 students who read medical journals regularly,73 (73.7%) students were from the last two years of MBBS.
(Figure 2).

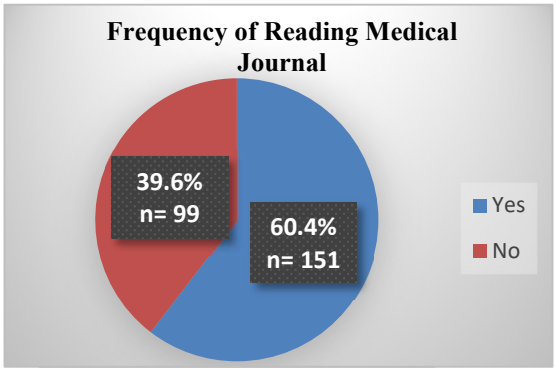

Figure 2: Frequency of Reading Medical Journal

However, only 75 (30%) of students had read their first medical journal before the research year i.e., 4th year. When asked about the frequency of reading medical journals, only 30 (12) % students read medical journals monthly while 30 (12%) students read only once a year. (Figure 3)

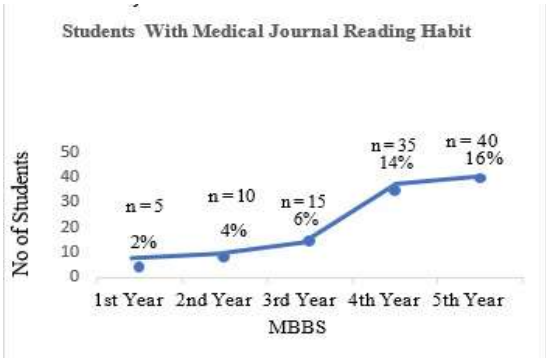

Figure 3: Student with medical journal reading habit

Total of 177 (81%) students showed a willingness to participate in research projects if provided with the opportunity, out of which 18 (45%) students wanted to work as investigator or co- investigator, 8 (20%) and 6 (15%) of students wanted to be data collector and paper writer, respectively. However, 8 (20%) of students showed no interest in doing research. Only 14 (35) % students said that they were part of any ongoing research projects with the maximum number of students from the 4th-year MBBS class. 75 (30%) students had previously participated in research projects in any capacity with the maximum number of students from the final year as they have passed through the research year while 175 (70%) students did not have any practical experience in research. (Figure 4)

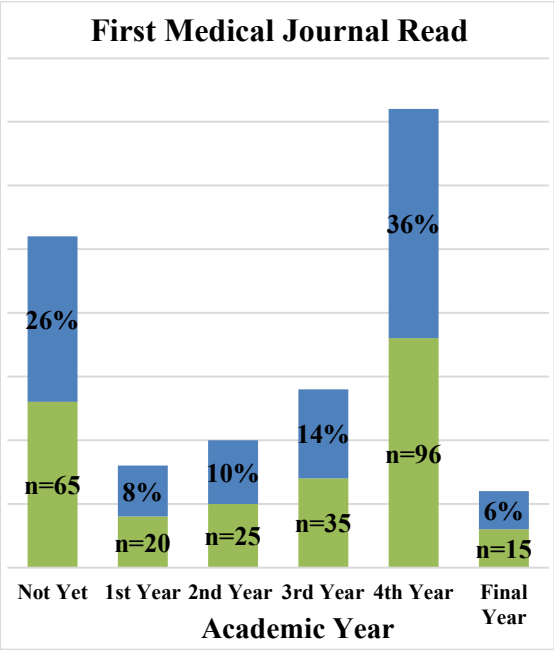

Figure 4: First Medical Journal Read

Ten variables were used to assess the knowledge of students regarding research methodology on 5- a point Likert scale (Table 1).

Table 1: Assessment of Student Knowledge of Research Methodology

Variables	Never Heard. (1)	Not Confident (2)	Little Confident (3)	Somewhat Confident (4)	Very Confident (5)
Designing a study	32 (13)	97 (38)	44 (18)	62 (25)	15 (6)
Study Sampling	20 (8)	43 (17)	78 (31)	33 (13)	76 (31)
Participant recruitment	15 (6)	79 (31)	18 (7)	109 (44)	29 (12)
Paper Preparation	30 (12)	42 (17)	86 (34)	55 (22)	37 (15)
Paper Presentation	45 (18)	34 (14)	63 (25)	95 (38)	13 (5)
Communication Skills	55 (22)	99 (40)	36 (14)	29 (12)	31 (12)
Information gathering & evaluation Skills	14 (6)	15 (6)	11 (4)	21 (8)	189(76)
Teamwork	55 (22)	48 (19)	12 (5)	113 (45)	22 (9)
Project Management Skills	56 (22)	33 (13)	29 (12)	81 (32)	51 (21)
Time management	43 (17)	28 (11)	132 (53)	14 (6)	33 (13)

The scoring system was developed to categorize the knowledge into three categories. The minimum score on the scale was 1 while the maximum score was 50.

Three categories were distributed as follows: Score 1 – 25 = poor knowledge, 26- 35 = fair knowledge, score 36 – 50 = good knowledge. Overall, 62 (25.6%) students had poor knowledge, 152 (60.8%) students had fair knowledge and only 34 (13.6%) students had good knowledge of research methodology in comparing the knowledge of research methodology among all five years of MBBS students, 120 (48%) of 1st year MBBS students had poor knowledge of research methodology while 125 (50) % has fair knowledge and only 5 (2%) had good knowledge. While in 2nd year

the poor knowledge percentage decreased to 80(32%) while 140(56%) had fair knowledge and 30 (12%) had good knowledge. However, only 60 (24%) of 3rd year students had poor knowledge while 165 (66%) and 25 (10%) of students had fair and good knowledge respectively. Meanwhile, in 4th year, which is a research year, 50 (20%) of students had poor knowledge, 140 (56%) had fair and 60 (24%) had good knowledge. 5th year, which is the final year of MBBS, 190 (76%) and 50 (20%) of students had fair & good knowledge of research methodology respectively, while only 10 (4%) had poor knowledge.

DISCUSSION

Any curriculum's creation, upkeep, and improvement depend heavily on research.[9] In order to facilitate targeted learning by identifying the areas that require the greatest development, our primary goal was to evaluate students based on their awareness, attitude, and skills. In the US, the UK, and other countries, undergraduate research is also seen as a vital component of general higher education.[10] 200 (80)% students expressed interest in participating in the research, and the majority of students understood the importance of understanding the research technique. These findings were in line with the study, which found that almost 225 (90%) of students were interested in participating.[11] Nearly two-thirds of students believe that their exposure to research is insufficient or irrelevant. 95 (38%) of students, most of whom were from the first two MBBS classes, were unaware of the proper required research year. Most students were unaware of active college research programs, as evidenced by the fact that less than half of them were aware of them. Because the medical sector requires constant learning and progress, reading medical journals on a daily basis helps one come up with creative ideas and stay updated on the most recent studies, research recommendations, and advancements in the area. Just 35 (14%) of students read journals monthly, which is quite concerning because it will be difficult for them to stay up to date with the most recent findings and advancements. Additionally, 150 (60%) of students were falling behind in this practice. Nearly one-third of students had previously engaged in research of some type, and nearly the same proportion were involved in ongoing research initiatives. However, as we promote evidence-based practice, this figure ought to be far higher. The results were positive, though, since 200 (80%) of students expressed interest in participating in future studies. Given the chance, the majority of them wish to become investigators or co-investigators and gain expertise in conducting research.186 (74.4%) of students possessed fair to good understanding of research technique, according to their overall knowledge score. With each academic year, medical students' overall scores improved: in their first year 130 (52%), second year 170 (68%), third year 190 (76%), fourth year 200 (80%), and fifth year 240 (96%). This result was in line with a study conducted on American and Saudi Arabian undergraduates that found that students' knowledge increased in accordance with their advanced academic year.[12] This study highlights a generally positive attitude toward research among undergraduate medical students, although notable gaps remain in awareness and practical engagement. These findings align with a study conducted in Karachi University, where students show enthusiasm for research but lack adequate training and opportunities to engage meaningfully in it.[13] In this study, only 84 (33.6%) students were currently participating in research, and just 75(30%) had any past experience. This is consistent with results from Egypt, where 110 (44%) medical students could identify the components of a scientific paper, but lack of time was the most addressed barrier for not doing research.[14] A study conducted among medical students at Oujda Medical School Morocco revealed a high level of attitude towards research, but low level of knowledge score. This mirrors the knowledge score findings in this study, where only 13.6% of students had a “good” level of research knowledge.[15] The fact that knowledge scores

got better from first to last year shows that exposure to research has an overall impact. However, the change happened rather slowly, which means that more structured and early approaches are needed.[16] According to this study, 200 (80%) of students are willing to participate in future research projects if provided with guidance and opportunity. Similarly, a large-scale multicenter study in six Arab countries found that students with prior research experience were significantly more likely to have higher knowledge scores and greater willingness to engage in research.[17] The necessity for thoughtful and long-term integration of research training in undergraduate medical education is generally highlighted by these findings. Students' interest and effective research participation can be bridged by early exposure, systematic mentorship, and practical participation in institutional research projects.[18]

CONCLUSION

Medical schools must concentrate on incorporating training in specific research skills into every facet of the undergraduate medical curriculum so that students believe these skills apply to the everyday work of all doctors, not just those who conduct full-time research. Every year that goes by, awareness increases, but the improvement is still gradual. Regularly interacting with pupils can help improve this. Although their attitude toward conducting research is generally positive, it is not as strong during the first two academic years, maybe as a result of their first lack of exposure to it.

LIMITATIONS

This is a single institute study so results cannot be generalized to the whole population.

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CONFLICT OF INTEREST

The authors have no conflicts of interest.

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None

ETHICAL APPROVAL:

Institutional Review Board (IRB) of Continental Medical College, Pakistan approved the study with reference # 38/IRB/CMC.

STUDENTS CONSENT:

Informed verbal consent was obtained from participants before data collection.

AUTHORS' CONTRIBUTION:

SB: Study design, Methodology and Paper writing
AS: Data Collection and Literature review
MAS: Statistical Analysis

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Original Article

EVALUATION OF THE DIETARY PATTERNS AND EATING BEHAVIOR OF CHILDREN WITH AUTISM SPECTRUM DISORDER BY USING BRIEF AUTISM MEALTIME BEHAVIOR INVENTORY

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Abstract:

Background: Autism spectrum disorder is a neuropsychiatric disorder. The objective was this study aimed to assess dietary patterns, eating behaviors of the children with autism spectrum disorder and to find out the association of different foods with BMI.

Material and Methods: It was a cross-sectional study. 65 participants between the ages of 5 to 20 years were selected by using non probability convenience sampling technique. Data on food preferences, portion sizes, and food types were collected using the Food Frequency Questionnaires (FFQ) and Brief Autism Mealtime Behavior Inventory (BAMBI). Data was gathered from caregivers using a structured questionnaire, and quantitative analysis was performed using SPSS version 30).

Result: Among children with autism 19 (35.2%) obese. The eating behavior of participant revealed that children exhibit resistive behavior at almost every meal which accounts for 12 (22.2) %. Significant proportion of children with ASD 13 (24.1%) had preference for the same food. The *p* value demonstrate that there was no association between BMI and intake of different food from various food groups.

Conclusion: The study revealed that most children with ASD were found to have abnormal BMI for their age. The results also showed that the consumption of beverage, fruits and meat groups were good but they lacked in consumption of other food groups like vegetables, grains and dairy groups which can impact their overall health.

Keywords: Autism Spectrum Disorder (ASD), Eating Behaviors, Dietary patterns, Food preferences.

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impaired social and communication skills and repetitive and restrictive behaviors manifesting in the first few years of life and tending to persist into adolescence and adulthood.[1] Genetics and neuroscience have identified intriguing patterns of risk, but without much practical benefit sofar.[2,3] The main cause responsible for autism is still unknown but the genetic factors along with a set of environmental and epigenetic element are said to play a key role. Almost 1 in every 100 children are diagnosed with autism spectrum disorder around the world.[4] Patients with ASD experience many co-existing developmental conditions. About 20% of children with ASD

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have average or above average intelligence. They are most likely to develop speech skills by the age of six.[5] Some children may emerge intellectually impaired in some region, yet may be extraordinary in others. Some might show latest expertise in mathematics, perusal counting, memory, art, along with music. Thus, some children with ASD have the average intellectual ability.[6]

The diagnostic and statistical Manual of Mental Disorders, 5th edition (DSM-5) defined levels of ASD. The 5th edition criteria provide three clear levels based on the patient's requirement for help.[7] Level 1 is the mildest and or "highest functioning "form of autism. These children experience some inflexibility of behavior like difficulty in switching between tasks, planning, and staying organized.[8] Social communication and stereotyped behaviors are present more obviously in children with ASD level 2. ASD level 3 is characterized by severe challenges in social communication as well as extremely inflexible behavior.[9] Children with ASD suffer more feeding problems than children with normal developmental milestones. Food selectivity or picky eating, are common among children with ASD.

Avoidant-restrictive food intake disorder (ARFID) is a diagnosis in the “Feeding and Eating Disorders” section of the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5). These eating disturbances that lead to deficits in energy or nutritional intake. Parents of children with autism spectrum disorder (ASD) frequently report that their children have selective eating behaviors and refuse many foods.[10]

A cross-sectional study involving 144 children (55 with ASD and 91 neurotypical) aged 6 to18 years discovered that children with ASD exhibited significantly higher rates of food selectivity (60.6% vs. 37.9%), inadequate nutrient intake (50% vs. 22%) and mealtime behavioral issues compared to their non autistic peers.[11] Anorexia nervosa and binge eating is also common in children with ASD. Abnormalities in breastfeeding and acceptance of complementary foods have been described by most of the studies evaluating ASD early feeding history.[12] Among the various eating and mealtime behaviors identified in ASD children and adolescents, the most common was food selectivity.[13]

Frequent nutritional screening and evaluation of children with ASD is an important clinical consideration because they may have multiple risk factors that could increase the prevalence of nutrient deficiency. These children often present with nutrition-related health problems, including gastrointestinal discomfort, inflammation of the intestines, diarrhea, constipation, and acid reflux. To assess the nutritional status of these children, parents/caretaker are asked to provide detailed information on the child's food intake in order to locate a food intake record and complete a dietary questionnaire.[14]

Eating is recognized as one of the issues faced by children and adults affected by ASD so, it should be assessed using specific tools. The Brief Assessment scale for Mealtime Behavior in Children (BAMBI) and 24-h recalls is the most commonly used dietary assessment tools. BAMBI consists of 18 items which covers key domains such as food refusal, limited variety, mealtime rigidity, and disruptive behaviors. Its strength lies in its ability to capture behavioral feeding challenges unique to children with ASD, which may not be evident through dietary intake tools alone.[15]

Although global literature has established a link between ASD and feeding challenges such as food selectivity, emotional eating, and nutrient inadequacies, there is a significant lack of context-specific evidence from low- and middle-income countries like Pakistan. Most existing studies are concentrated in Western or high-income settings, where access to early diagnostic services, specialized dietary support, and parental education differs vastly from that of the Pakistani population. In Pakistan, dietary patterns are heavily shaped by sociocultural practices, economic constraints, and limited access to autism-specific nutritional care. Local

staple foods, frequent use of high-fat and sugary items, and food insecurity further complicate nutritional outcomes. Additionally, limited awareness of ASD symptoms, delayed diagnoses, and a shortage of trained paediatric dietitians and therapists create substantial barriers to early dietary intervention.

While a few Pakistani studies have addressed general ASD prevalence or parental satisfaction with dietary interventions, there is no comprehensive, evidence-based assessment focused on both mealtime behaviors and actual dietary intake patterns in this population, especially at the preschool level. This study aims to assess dietary patterns, eating behaviors of the children with autism spectrum disorder. The findings highlight the need for regular monitoring and early identification of mealtime behavioral and nutrition problems among preschoolers with ASD. This study also provides the recommended strategies to tackle the dietary patterns and eating behavior of children with ASD.

MATERIALS AND METHODS

A cross-sectional study was conducted in 4 autism centers which were Step ahead autism care center, Rising Sun Institute for Special Children, Autism Institute of Pakistan and Love and care autism center with approval from Research Ethics and Support Committee under approval number RE-008-2025 through a non-probability convenience sampling method.

A sample size of 65 was calculated using Open Epi based on a 95% confidence level. The study was completed in 3 months from December 2022 to February 2023. The participants included in this research were the caregivers of children with autism spectrum disorder. Caregiver of children from ages 5 to 10 years were the target population of this research.

All four centers helped to arrange meeting with caregivers to fill the questionnaire. Data regarding the food preferences, portion size and food type of the participant were collected using the Food Frequency Questionnaire (FFQs). The parent-reported 18-item Brief Autism Mealtime Behavior Inventory (BAMBI) was used in the study for evaluating the eating behavior problems exhibited by the participants. Responses to the questions were represented by Likert scale. After, taking permission from the centers, data was collected from the caregivers of children using a structured questionnaire.

Height and weight of children were recorded with the help of weighing scale and stadiometer and plotted on CDC growth charts. Quantitative data analysis of questionnaire was performed through statistical tools, excel and SPSS (IBM 30). The BMI, resistive behaviour, preference for the same food and food types intake per week were presented through frequency tables. The association between food intake from different food groups and BMI was checked by using chi square test. The p-value of 0.05 or less was considered significant.

RESULTS

The participants comprised both genders. i.e.61% of boys and 39% girls. The CDC growth chart BMI for age 2 to 2years were used for the interpretation of weight status. 12% children had BMI below 5th percentile and 16%have BMI between 5th and 85th percentile. 13 % children had BMI between 85th to 95th percentile. 19% had BMI above 95th percentile. (Table 1)

Table:1 Percentage of the health status of Children according to BMI

Health status according to BMI	No./Percentage of children
Underweight	**12 (22%)**
Healthy	**16 (30%)**
Overweight	**7 (13%)**
Obese	**19 (35%)**

Based on the data, the questions were divided into three broad categories. The categories include resistive behaviour, preference for the same food and food types intake per week. At the end the association between food intake and BMI was checked.

The data represented the frequency distribution of responses of children with Autism Spectrum Disorder (ASD) regarding their resistive behaviour towards food.The data represented the frequency distribution of responses of children with Autism Spectrum Disorder (ASD) regarding their preference for the same food. The responses were categorized into five different levels, ranging from "never/rarely" to "at almost every meal."(Table 2)

Overall, the data highlights the diversity of preferences for the same food among children with ASD. Significant proportion of children in this study had a strong preference for the same food and were likely to eat the same thing repeatedly. (Table 3)

This data showed the association of different food with BMI. According to Table no. 4 Chi-square analyses revealed no statistically significant association between BMI and the consumption of milk ($p = 0.464$), yogurt ($p = 0.930$), or cheese ($p = 0.798$). (Table 4) Chi-square analysis showed no statistically significant association between BMI categories and the intake of bananas ($p = 0.748$), apples ($p = 0.331$), oranges ($p = 0.604$), or fruit juice ($p = 0.632$). No significant linear-by-linear trends were observed for any fruit item, suggesting that fruit consumption was not associated with BMI status in this population."

Association of BMI with vegetable shows that there was no significant associations between BMI and the intake of carrots ($p = 0.132$), mixed vegetables ($p = 0.369$), peas ($p = 0.237$), or cucumbers ($p = 0.924$) based on the Pearson Chi-Square test. Association of MBI with cereal shows that there was no statistically significant association between BMI categories and the intake of white bread ($p = 0.653$) or whole grain bread ($p = 0.206$) and white rice ($p=0.203$) Association of MBI with animal protien shows that there was no significant relationship between BMI and intake of eggs ($p=0.117$), chicken ($p=0.273$) and fish ($p=0.934$). We asked parents about the different food types their children take every week. The food categories included were dairy foods, fruits, vegetables, bread, cereals, and starchy foods, meat and meat group. The weekly intake of various food groups among children was assessed, focusing on dairy products, fruits and juices, vegetables, and the meat and fish group. Regarding dairy products, 15 (28%) of children never consumed yogurt, 10 children (19%) never drank milk, and 20 (37%) never ate cheese. Only 12 (22%) consumed milk daily, compared to 7 (13%) for yogurt and 3 (6%) for cheese. A significant proportion also reported consumption once per week—milk 7 respondents (13%), yogurt 14 respondents (26%), and cheese 16 respondents (30%). Regarding fruit and fruit juice consumption, 30 respondents (39%) said they had never eaten oranges or 21 respondents (55%) said they had never consumed fruit juice. Apples and bananas were never eaten by 8 (19%) and 10 (14%) of people, respectively. In all categories, daily intake was low, with only 4 (8%) of people eating apples and 3 (6%) eating bananas. For vegetables, many children had limited intake. A sizable portion never ate mixed vegetables 19 (35%), peas 20 (37%), cucumber 18 (34%), or corn 22 (41%). Lentils16 (30%) and carrots 9 (16%) had somewhat less "never" answers. The majority of kids only ate vegetables once a week, with 24 (45%) of them consuming carrots, 17 (31%) corn, 25 (47%) peas, and 14 (25%) lentils. All vegetables were consumed at relatively low levels each day, with mixed vegetables accounting for 3 (6%) and carrots for 4 (8%).Fish consumption was likewise restricted in relation to the meat group. According to the report, 21 (38.89%) of children ate fish once a week, 5 (9.26%) twice a week, 3 (5.56%) three times a week, and only 1 (1.85%) four times a week or daily.

Table: 2 Frequency and Percentage of resistive behaviour towards food. (n=54)

	Never/rarely	Seldom	Occasionally	Often	At almost every meal
Children who scream during meal time					
Frequency	32	3	4	4	11
Percentage	59.3%	5.6%	7.4%	7.4%	20.4%
Children who remain seated at the table during mealtime					
Frequency	11	7	9	6	21
Percentage	20.4%	13.0%	16.7%	11.1%	38.9%
Children expel almost at every meal					
Frequency	29	8	3	4	10
Percentage	53.7%	14.8%	5.6%	7.4%	18.5%
Children who turn away from food					
Frequency	31	5	4	7	7
Percentage	57.4%	9.3%	7.4%	13.0%	13.0%
Children who show aggressive behavior during mealtime.					
Frequency	29	7	3	3	12
Percentage	53.7%	13.0%	5.6%	5.6%	22.2%
Children who show self-injurious behavior during mealtime					
Frequency	33	2	5	2	12
Percentage	61.1%	3.7%	9.3%	3.7%	22.2%
Children who show disruptive behavior during mealtime					
Frequency	33	7	2	3	9
Percentage	61.1	13.0	3.7	5.6	16.7
Children who show closes mouth during mealtime					
Frequency	30	4	6	5	9
Percentage	55.6	7.4	11.1	9.3	16.7

Table: 3 Frequency and Percentage of Children with ASD regarding their preference for the same food n=54

	Never/rarely	Seldom	Occasionally	Often	At almost every meal
Children who remain flexible during mealtime					
Frequency	19	5	5	8	17
Percentage	35.2%	9.3%	9.3%	14.8%	31.5%
Children who are willing to try new foods					
Frequency	13	14	2	13	12
Percentage	24.1%	25.9%	3.7%	24.1%	22.2%
Children who dislike certain foods					
Frequency	8	4	8	9	25
Percentage	14.8%	7.4%	14.8%	16.7%	46.3%
Children who refuse to eat chewable food					
Frequency	30	3	4	6	11
Percentage	55.6%	5.6%	7.4%	11.1%	20.4%
Children who prefer same food at every meal					
Frequency	14	5	14	6	15
Percentage	25.9%	9.3%	25.9%	11.1%	27.8%

Children who prefer crunchy food					
Frequency	16	5	5	16	13
Percentage	29.6%	9.3%	7.4%	29.6%	24.1%
Children who accept variety of foods at each meal					
Frequency	18	5	8	11	12
Percentage	33.3%	9.3%	14.8%	20.4%	22.2%
Children who prefer to have serve in a particular way					
Frequency	25	2	11	5	11
Percentage	46.3%	3.7%	20.4%	9.3%	20.4%
Children who prefer only sweet foods at each meal					
Frequency	32	8	6	7	1
Percentage	59.3%	14.8%	11.1%	13.0%	1.9%
Children who prefer food prepared in a particular way					
Frequency	15	6	9	8	16
Percentage	27.8%	11.1%	16.7%	14.8%	29.6%

Table 4: Association of food products with BMI

	p-Value	df	Asymptotic Significance (2-sided)	Value	df	Asymptotic Significance (2-sided)	Value	df	Asymptotic Significance (2-sided)
	Milk with BMI			Yogurt with BMI			Cheese with BMI		
Dairy Products	17.880[a]	18	.464	12.339[a]	21	.930	15.478[a]	21	.798
	White Bread with BMI			Whole Grain with BMI			White rice		
Cereal	17.934[a]	21	.653	19.166[a]	15	.206	26.103[a]	21	.203

	Banana with BMI			Apple with BMI			Orange with BMI			Fruit Juice With BMI		
	p-Value	df	Asymptotic Significance (2-sided)	Value	df	Asymptotic Significance (2-sided)	Value	df	Asymptotic Significance (2-sided)	Value	df	Asymptotic Significance (2-sided)
Fruits	16.385[a]	21	.748	23.248[a]	21	.331	15.831[a]	18	.604	9.814[a]	12	.632
	Carrot with BMI			Mix Vegetable with BMI			Peas with BMI			Cucumber with BMI		
Vegetable	28.305[a]	21	.132	19.370[a]	18	.369	11.596[a]	9	.237	5.843[a]	12	.924
	Egg with BMI			Chicken with BMI			Beef with BMI			Fish with BMI		
Animal Protein	28.875[a]	21	.117	24.433[a]	21	.273	12.877[a]	18	.799	7.728[a]	15	.934

DISCUSSION:

The findings of the study provide important new information about the eating habits and mealtime routines of kids with ASD. It was discovered that a significant amount of participants had abnormal BMIs, with 22% being underweight and 35% being obese. This dual burden of malnutrition is consistent with new research that indicates, depending on dietary and socioeconomic circumstances, children with ASD may be at risk for both undernutrition and obesity.[4,17] Our results indicate a higher prevalence of obesity than under nutrition, which contrasts with the findings of Amjad et al, who found that 61% of

children with ASD were underweight in a local Pakistani study, while recent work by de Souza et al identified obesity as a rising concern in Brazilian ASD populations, driven by unbalanced diets and reduced physical activity. In this study, resistive mealtime behaviors were highly prevalent among children with ASD.[18,19] For example, 38.9% of kids had trouble staying seated during meals, and 22.2% of kids behaved aggressively and hurt themselves. These results are in line with those of Nygren et al, who noted that a high prevalence of Avoidant/Restrictive Food Intake Disorder (ARFID) in children with ASD leads to behavioral outbursts and disturbed feeding.[20] Additionally, Lázaro and Ponda associated these behaviors to sensory sensitivity, which is prevalent in ASD and influences social eating interactions as well as food choices. When it comes to food selectivity, 24.1% of the children in this study preferred crunchy foods, and 27.8% of them preferred the same food at every meal.[14] Taste, texture, and temperature sensitivity-related food aversions associated with ASD are reflected in these behaviours [21,22]. Such selectivity has also been linked to dietary deficiencies and restricted nutrient intake in children with ASD. The consumption of vegetables, grains, and dairy products was found to be below optimal, despite a comparatively high intake of eggs, meats, and beverages. As previously noted by Amin et al and García et al, who noted that ASD diets often lack fiber, calcium, and several micronutrients essential for healthy development. Interestingly, there was no statistically significant correlation between BMI and consumption of meat, dairy, fruits, vegetables, or grains.[23,24] These results are in line with those of Ghimire,[25] who also found no connection between autistic children's BMI and their food preferences, level of physical activity, or behaviour during mealtimes. This implies that metabolic variations, sedentary lifestyles, or medication use—factors other than dietary intake—may be more significantly responsible for weight abnormalities in this population.[26] Lastly, as also recommended by Khan and Ahmed, these results highlight the necessity of routine nutritional screening, behavioural evaluation, and caregiver support.[27] Addressing the behavioural and nutritional aspects of ASD requires a multidisciplinary team that includes behavioural specialists, occupational therapists, and registered dietitians.

LIMITATIONS

The sample size is relatively small, with only 54 respondents. Study did not explore the underlying reasons for children's eating behaviours, such as their sensory sensitivities and rigidity in routines and preferences.

CONCLUSION

This study demonstrates as no statistically significant association was found between BMI and intake of specific food groups. These results highlight the necessity of caregiver education, early screening for feeding issues, and tailored nutrition interventions. Promoting balanced nutrition and healthy eating habits in children with ASD requires multidisciplinary support from pediatricians, behavioral therapists, and dietitians.

SOURCE OF FUNDING

None

CONFLICT OF INTEREST

None

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Case Report

SUBCUTANEOUS HYDATID CYST OF THE RIGHT THIGH IN A YOUNG FEMALE: A RARE CASE PRESENTATION

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Abstract

Hydatid disease is a parasitic infection caused by *Echinococcus granuloses*, commonly affecting the liver and lungs. However, isolated subcutaneous hydatid cysts are rare and can pose a diagnostic challenge due to their atypical location and non-specific presentation. We report the case of a 22-year-old female from Ahmadpur, Pakistan, who presented with a painless, gradually enlarging swelling in the anterior aspect of her right thigh for the past 7 years. Physical examination revealed a soft, non-pulsatile, non-tender mass not adherent to the skin or underlying muscle. Ultrasonography suggested a multi-loculated cystic lesion in the subcutaneous plane, raising suspicion of a hydatid cyst. Serological testing for *Echinococcus* IgG was positive. The patient underwent surgical excision of the cyst under general anesthesia. Histopathological examination confirmed the diagnosis of a hydatid cyst with granulomatous inflammation and giant cell reaction. Postoperatively, she was managed with albendazole and discharged in stable condition. This case highlights a rare subcutaneous manifestation of hydatid disease in the thigh. It emphasizes the importance of considering parasitic infections in the differential diagnosis of long-standing soft tissue swellings, especially in endemic areas. Early surgical intervention combined with antiparasitic therapy is essential for complete resolution and recurrence prevention.

Keywords: Echinococcus granuloses, Hydatid disease, hydatid cysts, parasitic infection

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INTRODUCTION

Hydatid disease, or echinococcosis, is a zoonotic infection caused predominantly by the larval stage of *Echinococcus granuloses*[1]. It is endemic in sheep-raising areas such as the Middle East, South Asia, Africa, and parts of South America[2]. Humans act as incidental intermediate hosts in the parasite's life cycle, typically acquiring infection through ingestion of eggs from contaminated food or direct contact with infected dogs[3,4]. The liver (70%) and lungs (20%) are the most common sites of involvement, while primary subcutaneous hydatid cysts remain exceedingly rare, accounting for less than 2% of all cases[5,6,7]. Subcutaneous cysts are thought to result either from hematogenous dissemination or lymphatic spread and may go unrecognized due to their indolent progression and non-specific presentation.[17] These cysts can mimic lipomas, abscesses, or benign soft tissue tumors, leading to diagnostic delays[8].

We report a rare case of an isolated subcutaneous hydatid cyst located in the anterior compartment of the right thigh in a

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young female patient. The chronicity of the lesion, unusual anatomical site, and absence of systemic involvement make this case clinically significant and educationally valuable, especially for physicians practicing in endemic regions.

CASE DESCRIPTION

A 22-year-old female, resident of Ahmadpur, Pakistan, belonging to a lower-middle socioeconomic background, presented to Bahawal Victoria Hospital, Bahawalpur. The patient reported a progressively enlarging swelling in the anterior aspect of the right thigh for the past 7 years. The swelling was first noticed 7 years ago and was initially small and painless. Over time, it gradually increased in size. The swelling was not associated with fever, vomiting, trauma, or systemic symptoms. It was irreducible and did not show signs of inflammation or plasticity. The patient reported no history of Diabetes Mellitus (DM), Hypertension (HTN), ischemic heart disease (IHD), Tuberculosis (TB), or Asthma. She had undergone two previous Cesarean sections, performed three years and one and a half years ago, respectively Family history was non-contributory, with no known familial occurrence of Diabetes Mellitus, Tuberculosis, or Ischemic Heart Disease. The patient reported intermittent use of over-the-counter painkillers for discomfort. She had no known drug or food allergies. The patient has a normal sleep pattern and regular bowel and bladder habits. There is no history of substance abuse. She resides in a rural area, which may expose her to livestock and stray dogs. The patient presented with a swelling in the right thigh that had persisted for approximately seven years. She described it as initially small and painless, gradually increasing in size over time. The swelling was not associated with fever, vomiting, weight loss, or trauma, and it was non-reducible with no changes in skin color, discharge, or pulsation. There was no history suggestive of systemic involvement or an allergic response.

On general physical examination, the pulse was 82 bpm, blood pressure was 116/70 mmHg, respiratory rate was 16/min, and the patient was afebrile. There was no evidence of pallor, jaundice, cyanosis, or pedal edema. Systemic examination revealed a soft, non-tender abdomen with normal bowel sounds. Cardiovascular examination showed audible S1 and S2 with no murmurs. Respiratory examination revealed normal vesicular breath sounds without any added sounds. Central nervous system examination showed a Glasgow Coma Scale of 15/15 and no focal neurological deficits. Local examination of the right thigh revealed a soft, non-tender swelling located on the anteromedial aspect, measuring approximately 12 × 8 cm. It was not fixed to the overlying skin or underlying muscle. The skin over the swelling appeared normal, without ulceration, sinus, or scarring. The swelling was non-pulsatile and had a temperature comparable to the surrounding skin. No lymph nodes were palpable on examination. Diagnostic Assessment Laboratory investigations showed a hemoglobin level of 12 g/dL, which is mildly low. The total leukocyte count was 7.6 $\times 10^3/\mu L$, within normal limits, and platelet count was 278 $\times 10^3/\mu L$, which is also within the normal range. Other red cell indices including MCV, MCH, and MCHC were within reference limits. The coagulation profile showed a prothrombin time of 13 seconds, which is normal. APTT was prolonged at 40 seconds (reference range: 27–34 seconds), and the INR was 1.2, which is slightly elevated but acceptable for surgery. Biochemical analysis revealed normal serum urea at 18 mg/dL, creatinine at 0.5 mg/dL, and a random blood glucose level of 65 mg/dL. Liver function tests showed ALT of 18 U/L and total bilirubin of 0.4 mg/dL, both within normal limits. Serology tests showed non-reactive results for HBsAg and anti-HCV. Echinococcus IgG was positive, indicating hydatid disease. Ultrasound of the right thigh (dated 07-05-2025) revealed a well-defined cystic lesion in the subcutaneous tissue of the anterior right thigh, containing multiple

internal cysts likely representing daughter cysts[9]. Fluid within the cyst showed internal echoes and folded membranes suggestive of a hydatid cyst. There was no evidence of extension into adjacent muscles or bone, and no internal vascularity was seen on Doppler study. The overall impression was highly suggestive of a subcutaneous hydatid cyst. Gross examination of the excised tissue revealed a specimen measuring 13.4 × 6.8 cm containing membranous, thin-walled material with yellowish nodules. Microscopy showed the presence of a laminated chitinous cyst wall surrounded by granulomatous inflammation rich in lymphocytes, plasma cells, and eosinophils, along with a foreign body giant cell reaction. The final diagnosis confirmed the presence of a hydatid cyst.

Figure 1: Showing a multiloculated cystic lesion in the subcutaneous tissue of the right thigh, with internal daughter cysts suggestive of a hydatid cyst.

The patient was admitted on 05-May-2025 for planned surgical management. Routine coagulation profile, and serology were conducted. The diagnosis of hydatid cyst was confirmed by Echinococcus IgG positivity and characteristic ultrasound findings. The patient was kept nil per os (NPO) for six hours prior to surgery. Prophylactic antibiotics and ntravenous fluids were initiated preoperatively.

The surgery was performed on 10-May-2025. The procedure involved excision of a subcutaneous hydatid cyst and was conducted under general anesthesia by Dr. Hamza Hafeez with assistance from Dr. Ahmed Altaf and Dr. Laila. Intraoperatively, a multiloculated, tense cystic lesion measuring 12× 8 cm was identified in the subcutaneous fat of the anteromedial right thigh. It was not adherent to the surrounding muscle or fascia. A vertical incision was made over the anteromedial aspect of the right thigh. The cyst was carefully dissected and completely mobilized without rupture, thus minimizing the risk of dissemination[10].

The cavity was irrigated with normal saline to remove any residual contents, and hemostasis was secured. A Radiac drain was placed to manage postoperative fluid accumulation, and the wound was closed in layers with a crepe bandage applied. Postoperative monitoring included regular inspection of vital signs, drain output, and the wound site. Intravenous fluids administered were Ringer's Lactate and Dextrose Normal Saline. The patient received intravenous Ceftriaxone 1g twice daily, Metronidazole 400 mg three times daily, Phloren (for analgesia), and Nelbion (for nutritional support).

The Redivac drain was maintained and subsequently removed when output decreased to less than 20ml.To prevent recurrence of the hydatid disease, antiparasitic therapy was initiated postoperatively. g prescribed Albendazole (Zentel) 200t twice daily for 28 days[11]. She recovered well under standard observation protocols. Drain output decreased progressively, and there were no signs of local infection, hematoma, or allergic reaction. Pain was effectively managed with prescribed analgesics, and the wound remained clean and dry without signs of discharge or inflammation. The patient was discharged in stable condition upon completion of her inpatient treatment. At discharge, she was prescribed oral Albendazole 200 mg twice daily for 28 days, Voren (Diclofenac)50mg twice daily, Cap Zeph 20mg once daily, and Meloxicam twice daily.

Figure 2: Pre operative images of the surgery.

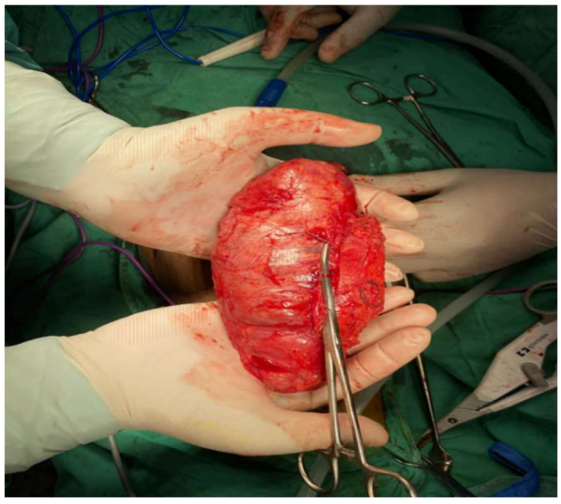

Figure 3: Per operative images of the surgery.

The patient was instructed to monitor the surgical site for signs of recurrence or infection, return for suture removal and wound inspection, and complete the full course of antiparasitic therapy. Long-Term Outcome At follow-up, the wound had healed well with no signs of recurrence or fluid accumulation. The patient remained asymptomatic, resumed normal activity, and reported no adverse effects from Albendazole therapy. No further imaging or serological signs of relapse were noted.

DISCUSSION

Hydatid disease (echinococcosis) is a parasitic infestation caused primarily by *Echinococcus granulosus*[6,12]. While the liver and lungs are the most common sites of cyst formation due to their role as first-line filters for hematogenous dissemination, subcutaneous hydatid cysts represent an exceptionally rare manifestation, occurring in less than 2% of all cases. These cases pose diagnostic challenges because they often mimic benign soft tissue tumors, abscesses, lipomas, or sebaceous cysts.

The present case is noteworthy due to the cyst's isolated location in the subcutaneous tissue of the right thigh, without hepatic or pulmonary involvement. The long-standing duration of 7 years, absence of systemic symptoms, and stable presentation without infection or rupture make this an unusual and educational case. The pathogenesis in such atypical cases is believed to involve lymphatic or hematogenous spread of the parasite bypassing the liver and lungs.

Diagnosis of subcutaneous hydatid cysts typically requires a high index of suspicion, especially in endemic regions[13]. Ultrasonography remains the initial imaging modality of choice, revealing the characteristic multiloculated, cystic appearance with internal daughter cysts and membrane detachment — often referred to as the "water lily sign"[14]. In this case, imaging was supplemented by positive Echinococcus IgG serology, further reinforcing the presumptive diagnosis. Surgical excision is the mainstay of treatment for hydatid cysts in soft tissue[15]. The aim is

complete removal of the cyst without rupture, as spillage can lead to recurrence, dissemination, or even anaphylactic shock[16]. Intraoperative use of sporicidal agents or copious irrigation with saline is standard to prevent secondary implantation. In our case, successful en bloc excision was achieved, and the cavity was thoroughly irrigated with normal saline. Histopathological findings confirmed the diagnosis, revealing laminated chitinous walls and granulomatous inflammation with giant cell reaction. Postoperative Albendazole therapy plays a critical role in reducing recurrence risk by sterilizing any microscopic residual parasitic elements[17]. The patient was prescribed a 28-day course, which she completed with excellent compliance and no adverse effects. This case highlights the importance of considering hydatid disease in the differential diagnosis of long-standing soft tissue swellings, particularly in endemic areas. It also underscores the necessity of careful surgical technique and the value of a multimodal treatment approach combining surgery with antiparasitic medication[18]. The patient describes feeling as "I had been living with this swelling in my thigh for many years and thought it was something harmless. It didn't cause much pain, so I ignored it. But when it kept growing, I became worried. I'm grateful to the doctors who took my condition seriously and explained everything clearly. The surgery went well, and I feel much better now. I'm also glad I don't have to worry about it anymore. I've learned that even if something doesn't hurt, it can still be dangerous, and I should never delay getting medical advice". Patient testimony (translated and documented with permission)

SOURCE OF FUNDING

None

CONFLICT OF INTEREST

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available for review upon request. The patient was assured of confidentiality, and all identifying information has been anonymized to protect privacy

AUTHOR'S CONTRIBUTIONS

MHH: Concept, Data Collection, Article Writing
MBY: Concept, Data Collection
LTQ: Technical Support, Critical Approval
HFS: Data Analysis, Critical Approval
MAR: Abstract, Introduction
HAF: Case Description

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