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ASSESSMENT OF PHYSICAL ACTIVITY AND PERCEIVED HEALTH AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract:

Background: Autism spectrum disorder (ASD) is a group of neurodevelopmental disorders characterized by impaired social and communicative behavior and a limited range of activities and interests before the age of 3 years.

Objective: To assess physical activity and perceived health among children with Autism Spectrum Disorder.

Methodology: Observational Cross-sectional study design was used to conduct Research. Sample of 163 patients (age 8-14 years) with ASD was taken. Non Probability Convenience Sampling Technique was used. After informed consent, International Physical Activity Questionnaire (IPAQ) and Childhood health Assessment Questionnaire (CHAQ) were used to collect data. Analysis was performed using SPSS version 25. For continuous variables Mean ± SD (Standard deviation) was used to analyze demographical data. Data was collected from Special Education Centers in four months after the approval of synopsis.

Results: IPAQ-C was used to assess physical activity of children. 57(35%) children had low physical activity, 84(51.5%) children had moderate physical activity, 21(12.9%) had high physical activity. CHAQ was use to assess perceived health. 51(31.3%) children had best possible health state and 112(68.7%) had worst possible health state.

Conclusion: Study concludes that children have moderate or low level of physical activity and decreased perception of health as majority had worst possible health state with Autism Spectrum Disorder.

Keywords: Autism Spectrum Disorder, Physical activity, Perceived health

Introduction

Autism Spectrum Disorder was initially characterized by Leo Kanner in 1943 in a seminal publication that included case studies of 11 youngsters. Since then, ongoing research and observation have led to the evolution of diagnostic criteria, which has produced the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, or DSM-IV. According to current definitions, autism disorder is characterized by confined, repetitive, and stereotyped patterns of behaviour, interests, and activity patterns in any of these domains before the age of 3 years (1). It is also characterized by qualitative impairments in social interaction and communication. "Autism spectrum disorder (ASD) is a group of neurodevelopmental disorders characterized by impaired social and communicative behaviour and a limited range of activities and interests". New discoveries have made it possible to identify some of the causes of ASD that include genetic and environmental risk affecting 2.3% children of 8 years in US and 2.2% of adults (2). Although there is evidence that certain symptoms of autism spectrum disorder (ASD) can manifest at a young age, the illness is typically diagnosed between the ages of 3 years and 5 years, as well as approximately at 11 years. Still, the majority of parents voice their worries during the first two years of life, but they don't receive a diagnosis for nearly three years after their initial consultation with a specialist. Before autism is diagnosed, it must have been present for at least 36 months, yet certain behavioral criteria (such stereotypies) are uncommon or unsuitable before the age of 2 yrs. Hence, the first step in a prompt diagnosis should be for parents to recognize the developmental issues with their child, which may call for closer observation and follow-up. The extreme clinical heterogeneity of ASD requires us to define symptoms that may

not be included in standard definitions of autism. These can vary throughout a child's life, but should be easy for professional care practitioners to check (3). The most common and often the first areas of concern are delays in speech and language development, some medical disorders, poor eye contact, abnormal levels of social responsibility, reduced play and communication, extremes of temperament and behavior, motor control all non-specific difficulties with sleeping, eating and atypical development developmental delay or loss of previously acquired skills). Over the years treatments have been developed for autistic children that have evolved from the philosophies. These include behavioral interventions, developmental and cognitive-behavioral interventions. According to Dawson and Osterling (1997), who reviewed programs for children with autism, the majority of these programs involve 15 to 25 hours of intervention each week. Empirical data also suggests that younger program participants receive greater benefits than older program participants (1). ASD is linked to substantial expenses for individuals, families, and services, as well as high comorbidity. In addition to social anxiety disorder, attention deficit hyperactivity disorder, and oppositional deficit disorder being more common in ASD patients than in the general population and in kids with developmental difficulties. ASD patients also frequently experience emotional and behavioral issues. Functional issues with eating, sleeping, and using the rest room also worsens. Preschool is when behavioral and emotional disorders are most prevalent, and many kids struggle with multiple issues at once (4). In order to support health and wellbeing, regular physical activity is essential. But there hasn't been much research on physical activity in kids with autism spectrum disorder (5). Physical activity (PA) has been shown to have significant health advantages for children and adolescents by numerous health organizations and scientific societies. It is recommended that children and adolescents engage in at least 60 minutes of moderate to vigorous PA every day. Individuals with autism-related conditions, such as communication issues, peer challenges, and difficulty integrating socially, may find it challenging to participate in PA activities. Children with autism also cannot play with their classmates or take part in team sports or other types of athletics. For a child with

ASD, following daily PA recommendations might also be challenging due to a lack of interest or motivation to exercise. However, in order to enhance PA in autism, alternative tactics or interventions must be created. Children with autism spectrum disorders require some time to become used to a new PA (6). Staying physically active is important for preserving health. Exercise improves mental health by reducing anxiety and depressive symptoms. It can be difficult for ASD patients to manage a chronic illness, and exercise can help with mood enhancement and general quality of life. Engaging in physical activities, such as team sports or workouts with others, offers a chance for social contact. Patients with autism may benefit from this as it fosters a sense of community and lessens feelings of loneliness. It can be separated into categories such as sports, jobs, conditioning, and other daily activities. "Exercise, a subset of physical activity, is planned, structured, and repetitive". Maintaining joint function, muscle strength and general wellbeing requires regular physical activity. Perceived Health is described as perception of a person's health in general, either by the person themselves or, in the case of proxy response, by the person responding. The impact of perceived health on Autism Spectrum Disorders (ASD) patients is multifaceted. The perception of their health can significantly influence various aspects of their lives, including physical, emotional, and social well-being. Perceived health directly affects how autistic patients manage their symptoms and adhere to treatment plans. Positive perceptions may lead to better adherence to medications, physical therapy, and other recommended interventions. The way autistic patients perceive their health can affect their social interactions. Positive perceptions may contribute to a higher level of social engagement, participation in activities, and the ability to maintain relationships. Negative perceptions, however, can lead to social withdrawal, isolation, and challenges in participating in school or social events. This can impact the development of social skills and a sense of belonging. Furthermore, negative perceptions may contribute to a decreased motivation to engage in necessary self-care activities, potentially leading to a worsening of symptoms and reduced overall physical health.

Addressing and supporting positive perceptions can contribute to better overall well-being and long term outcomes for these individuals.

Methodology

Study design was Observational Cross-sectional. Sample of 163 patients (age 8-14 years) with ASD was taken. Non Probability Convenience Sampling Technique was used. After informed consent, International Physical Activity Questionnaire (IPAQ) and Childhood health Assessment Questionnaire (CHAQ) were used to collect data. Patients were recruited from Autism Care Centers in Lahore. Research was conducted in a diverse range of health care settings encompassing both government and private sectors including: Autism Care Center, Lahore Garrison Institute of Special Education, Step up Autism Center, First Step Autism Center and Special Education School. Study included diagnosed patients of Autism Spectrum Disorder (7). The research did not include condition other than Autism Spectrum Disorder like Asperger disorder and Pervasive developmental disorder (7), children having severe cognitive impairment with autistic features, comorbidities associated with impaired cardiopulmonary fitness (e.g. heart or lung disease) and patients who are physically less active than their normal typically developing peers. Analysis was performed using SPSS version 25. For continuous variables Mean ± SD (Standard deviation) was used to analyze demographical data. Categorical data was presented through percentage and frequency. Bar charts, pie charts and histograms were used to present data graphically. Data was collected in four months after the approval of synopsis.

Results:

Study includes 163 children with Autism Spectrum Disorder with age 8-14 yrs Mean ± SD (11.749 ± 0.21276 years). Both boys and girls were included in study, 90(55.2%) girls and 73(44.8%) boys were included. Mean ± SD of height was (138.8712 ± 8.82837 cm). Mean ± SD of weight was (31.9877 ± 4.7583 kg). 78(47.9%) children performed exercises 2 days in a week, 48(29.4%) children performed exercises 4 days in a week and 28(17.2%) children performed

exercises 6 days a week. 48(29.4%) children have low physical activity, 79(48.5%) children have moderate physical activity, 36(21.1%) children have high physical activity. The children age at diagnosis with Autism Spectrum Disorder was between 4-7 years with Mean ± SD (4.4663 ± 0.11973). Parental age at time of birth was mostly between 30-47 years with Mean ± SD (31.5092 ± 0.7963). 18(11.0%) children with ASD had vaginal delivery, 36(22.1%) children had assisted vaginal delivery, 55(33.7%) children had C-section delivery, 43.4(26.4%) children had vaginal delivery after caesarean. 75(46%) children with ASD reported as socially active and 79(48.5%) children were reported as socially inactive. IPAQ-C and CHAQ were used to assess Perceived Health and Physical Activity. IPAQ-C has three categorizes to assess physical activity: Low physical activity, Moderate physical activity, High physical activity. 57(35%) children have low physical activity, 84(51.5%) children have moderate physical activity, 21(12.9%) have high physical activity. CHAQ has two categories to assess perceived health: Best possible health state and Worst possible health state. 51(31.3%) children had best possible health state and 112(68.7%) children had worst possible health state.

Table 1: Age of Children

Age of Children	
Mean	**Standard Deviation**
10.7160	1.86657

Table 2: Gender of Children

Gender		
	Frequency	**Percentage**
Female	90	55.2
Male	73	44.8
Total	163	100

Table 3: International Physical Activity Questionnaire

IPAQ		
	Frequency	**Percentage**
Low Physical Activity	57	35
Moderate Physical Activity	84	51.5
High Physical Activity	21	12.9
Total	163	100

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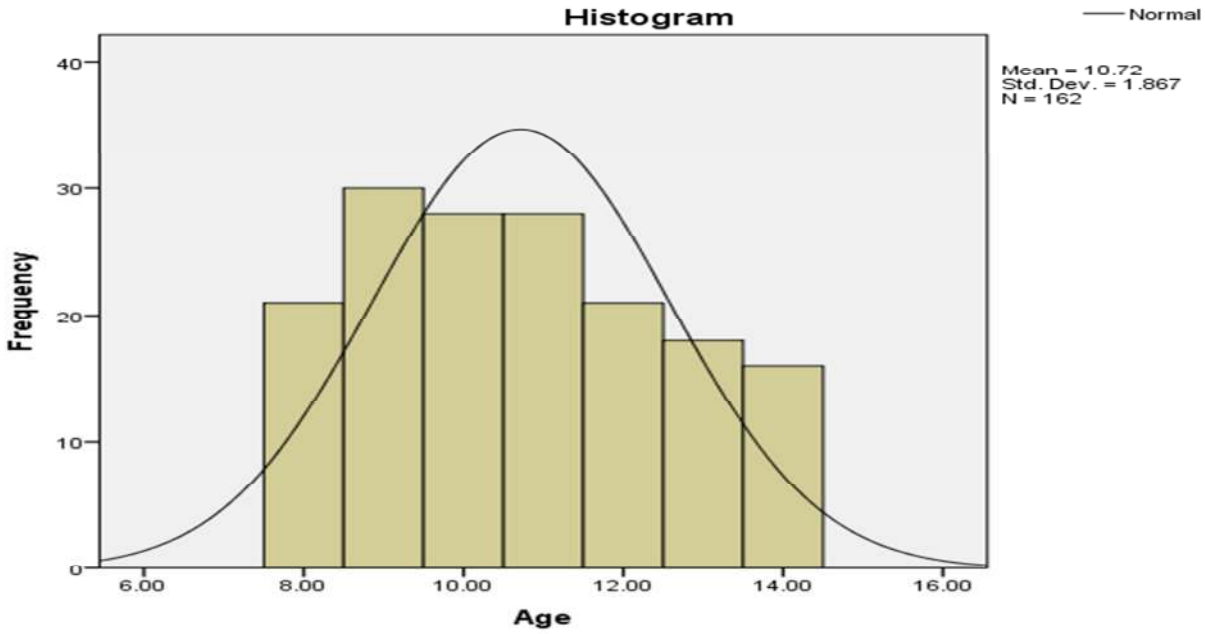
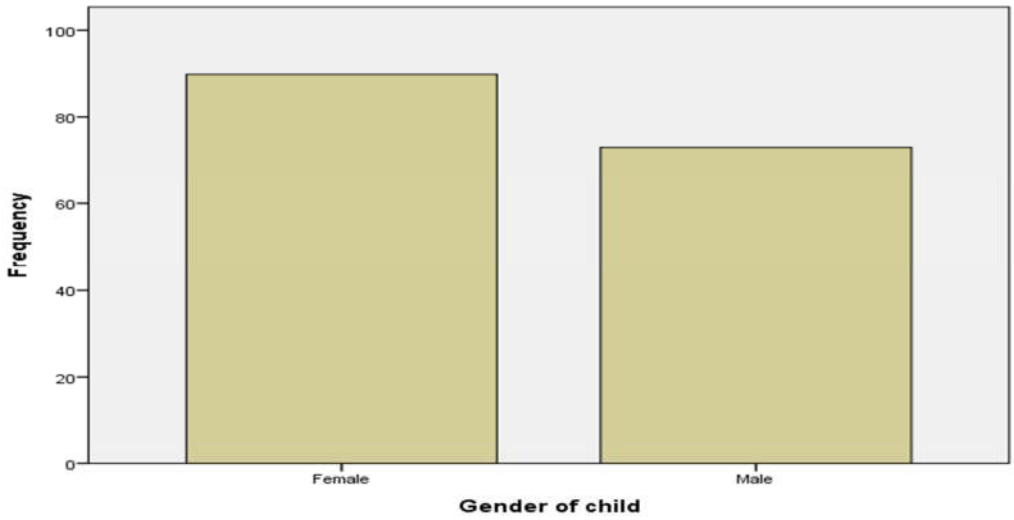


Graph 1: Age of Children



Graph 2: Gender of Children

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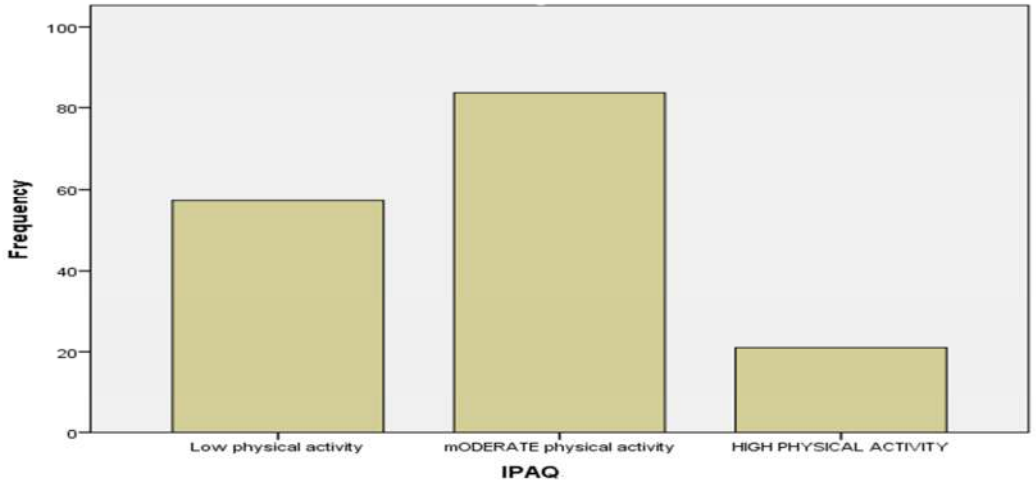
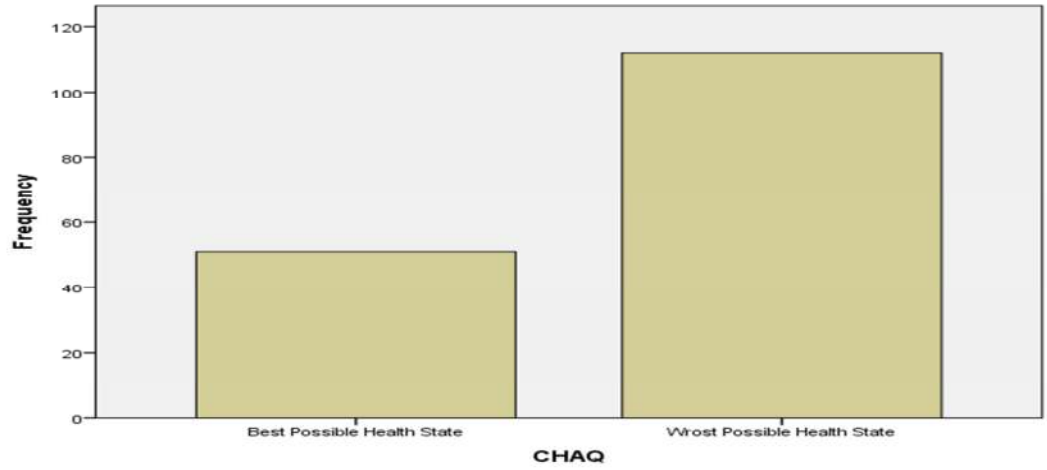


Graph 3: Childhood Health Assessment Questionnaire



Graph 4: International Physical Activity Questionnaire

Demographics

Age of Children	
Mean	**Standard Deviation**
10.7160	1.86657
Height of Child	
Mean	**Standard Deviation**
138.8712	8.82837

Weight	
Mean	**Standard Deviation**
31.9877	4.7583
Age at Diagnosis	
Mean	**Standard Deviation**
4.4663	0.11973
Parental Age at Time of Birth	
Mean	**Standard Deviation**
33.5892	7.651

Gender		
	Frequency	**Percentage**
Female	90	55.2
Male	73	44.8
Total	163	100
Mode of Delivery		
	Frequency	**Percentage**
Vaginal Delivery	18	11.0
Assisted Vaginal	36	22.1
C-Section	55	33.7
Vaginal Delivery after	43.4	26.4
Total	163	100
Exercise in a Week		
Days	**Frequency**	**Percentage**
2 Days	78	47.9
4 Days	48	29.4
6 Days	28	17.2
Total	163	100
Physical Activity Level		

	Frequency	Percentage
Low Physical Activity	48	29.4
Moderate Physical Activity	79	48.5
High Physical Activity	36	21.1
Total	163	100
Socially Active		
	Frequency	**Percentage**
Socially active	75	46.0
Socially inactive	79	48.5
Total	163	100

Discussion:

Study Assess the Physical activity and Perceived Health among children with Autism Spectrum Disorder. Study includes 163 children with Autism Spectrum Disorder with age 8-14 years. Analysis was performed using SPSS version 25. IPAQ-C and CHAQ were used to assess Perceived Health and Physical Activity. IPAQ-C has three categorizes to assess physical activity: Low physical activity, Moderate physical activity, High physical activity. 57(35%) children have low physical activity, 84(51.5%) children have moderate physical activity, 21(12.9%) have high physical activity. CHAQ has two categories to assess perceived health: Best possible health state and Worst possible health state. 51(31.3%) children had best possible health state and 112(68.7%) children had worst possible health state.

Study conducted in 2022 on Comparison of physical activity between children with autism spectrum disorders and typically developing children. 53 children with ASD and 58 typically developing children, ages 3 to 11 years, who took part in the Children's Activity and Meal Patterns Study (CHAMPS), had different levels of physical activity. After adjusting for age and gender, children with ASD and normally developing children both spent roughly the same amount of time each day engaging in moderate- to vigorous-intense activities (50.0 minutes

versus 57.1 minutes). After adjusting for age and sex, parents reported that children with ASD participated in significantly fewer types of physical activities (6.9 vs. 9.6, p <.0001) and spent less time annually (158 vs. 225 hours per year, p < 0.0001) than did typically developing children. This research founds different results from our research because parental reports were used which capture different aspects of physical activity compared to objective measures like accelerometers. Study found fewer types of activities and less total annual time, indicating a difference in variety and consistency rather than daily intensity levels. This research had also adjusted for age and gender, due to these reason children with autism spectrum disorder and typically developing child spent a similar amount of time per day in MVPA (50.0 minutes vs. 57.1 minutes).

Study conducted in 2017 on Physical Activity Levels, Frequency and Type among Adolescents with and Without Autism Spectrum Disorder examined the amount of time, kind, and frequency of physical activity engagement among adolescents with ASD (n = 35) and normally developing (TD) adolescents (n = 60), as well as the amount of time spent engaging in moderate-to-intense physical activity (MVPA). MVPA was assessed by accelerometers, and individuals' participation in physical activity was inquired about during interviews. Teens with ASD were less likely to meet the Physical Activity Guidelines for Americans (14 vs. 29%, p > 0.05) and spent less time in MVPA (29 min vs. 50 min/day, p < 0.001) than normally developing teens (TD). Teens under the age of sixteen who had ASD engaged in less activities than TD teenagers (5.3 vs. 7.1 activities, p<0.03). This study was conducted to provide a detailed comparison between activities of ASD children and children without ASD by using Accelerometer. Current study provides general view about physical activity of autistic children .This research utilizes accelerometer for objective measurement of MVPA.

Study conducted in 2022 on Physical Activity in Children and Adolescents with autism assessed by traxial accelerometer sought to investigate patterns of physical activity (PA) in children diagnosed with autism spectrum disorder (ASD) as well as factors that may influence physical activity. During the adolescent years, there

was a significant decline in activity in ASD. Boys with autism spectrum disorder were more active than girls. In comparison to after-school activities, participants were less active throughout the school day. A non-significant decrease in physical activity occurred on weekdays as opposed to weekends. Obesity, comorbidities, sedentary activities, and household structure were found to be additional factors that influence PA in children with ASD. This study is different from current study because this study additionally describes time at which autistic children were physically inactive and also describes gender and age at which autistic children were more physically inactive.

Study conducted in 2022 on Increased perceived stress is negatively associated with activities of daily living and subjective quality of life in younger, middle and older autistic adults to evaluate negative impact of perceived stress on activities of children with Autism Spectrum Disorder. Adults with autism reported much higher levels of perceived stress than a sample drawn from the general population. Those diagnosed as feminine at birth showed much higher levels of perceived stress than male autistic individuals. Significant contributions from felt stress were made to all regression models. Higher perceived stress was linked to lower levels of independence in daily living activities and lower subjective quality of life (QoL) in all categories (physical, psychological, social, environmental, and autism-related Quality of Life). Results of this research are much similar to current research which shows only subjective measure that perceived health is reduced but this research clarify that how reduced perceived health is executing negative impact on activities of these children on basis of gender.

Ethics Statement and Approval:

This study aims to assess the physical activity and perceived health among children with Autism Spectrum Disorder. The following outlines the ethical considerations for this research project.

a. Informed Consent:

• All participants were provided with a detailed written informed consent form explaining the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any point.

• The consent form clarified that participation is voluntary and anonymous.

• Only participants who provided written informed consent were included in the study.

b. Privacy and Confidentiality:

• All data was collected anonymously. No identifiable information was linked to participants.

• Data was stored securely and confidentially according to institutional guidelines.

• Participant confidentiality was maintained throughout the research process and in any publications resulting from this study.

c. Ethical Review:

• This study was submitted for review and got subsequent approval from the Departmental Research Committee of University of South Asia, Lahore.

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