European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 09, Issue 08, 2022

A CROSS SECTIONAL STUDY OF QUALITY OF LIFE, SELF ESTEEM AND QUALITY OF SLEEP AND ITS CORELATION IN ADOLESCENTS WITH ADHD

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ABSTRACT

Background: Health Related Quality of life (HRQoL) describes an individual's subjective perception of their position in life as evidenced by their physical, psychological, and social functioning. HRQoL has become an increasingly important measure of outcome in child mental health clinical work and research. In adolescence, there are increased environmental demands and it is important to identify factors that may impair psychosocial function and self-worth in the transition from adolescence to young adulthood. Sleep disorders, including insomnia, in adolescents with ADHD is well established and is shown to impair academic performance and self-esteem. This study aims to evaluate Quality of life, Self Esteem and quality of sleep and its corelation in adolescents with ADHD.

Material and Methods: In this cross-sectional study a total of 200 adolescents ranging from 12 to 18 years as per DSM V diagnosed as attention deficit/hyperactivity disorder (ADHD). The patients were divided in two groups i.e., in group I: 100 patients diagnosed with ADHD and in group II 100 healthy adolescents were included.

Results: The disorder's severity directly and indirectly affected the children's health related quality of life (HRQoL) and family burden. ADHD subjects revealed significantly lower scores on all self-esteem domains compared to controls. On the basis of quality of sleep between ADHD and controls the frequency of sleep problems in control group is found as 61.0% and 84.0% in ADHD group and the difference was statistically higher in ADHD group ($p<0.01$). In both parent and child rating score, the difference was significant (i.e., lower score for ADHD for both physical and psychological health).

Conclusion: A lower self-esteem profile is more common in subjects suffering from ADHD than in healthy controls, suggesting the importance of an early detection of psychological well-being in these children in order to reduce the ADHD symptoms long-term impacts.

Keywords: Quality of life, Insomnia, attention deficit/hyperactivity disorder, adolescents, Self Esteem

I. INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common developmental disorders with a prevalence of 3.0-7.0% in the general population and is associated with significant impairment symptoms.[1] As a consequence of pervasiveness, ADHD can negatively interfere with the general well-being, as well as with social life, academic performance, and development of social skills[2], which in turn, can lead to low self-esteem. ADHD is characterized by persistent patterns of inattention, hyperactivity and impulsivity, present in several life domains. Because of its chronic course it seriously affects the productivity, life expectancy and quality of life of those diagnosed.[3,4]

Extensive research has explored risk and protective factors related to low self-esteem development during adolescence. Reported risk factors include being a girl, the family's low socioeconomic status, parents' education level, family eligibility for public assistance, eligibility for free or reduced-cost school meals, the parents' employment status, and school performance and grades, as well as obesity.[5]

Prior researches reported that 50.0%-70.0% of children diagnosed with ADHD have sleep disturbances, including problems in initiating sleep (bedtime resistance or late sleep onset) and problems in maintaining sleep (restlessness or recurrent nocturnal awakening).[6] Recent studies found higher averages of sleep problems in children with ADHD than control groups as reported by their parents.[7,8] In this respect, studies which used sleep objective measures indicated that children with ADHD experience poor sleep efficiency, short sleep durations, and high delayed onset sleep, and high Sleep-disordered breathing compared with same-aged peers.[9]

Children with ADHD having sleep problems, sleep fragmentations, or sleep restrictions may also have excessive daytime fatigue, mood disturbances, attention and behavioral problems, all of which are critical for academic performance and a better quality of life (QoL).[10] It is well-known that children having ADHD are at high risk for difficulties in emotional, social and adaptive functioning, poor academic performance, and poor interpersonal relationships which in later life lead to poor psychosocial outcome. The chronic nature of ADHD and its consequences impair one or more components of the QoL.[11]

It has been found that health-related quality of life (HRQoL) is lower in ADHD children compared with that in healthy children, and the same has been reported for the members of

their families. The severity of the symptoms may increase the impact of ADHD on the children's HRQoL and family distress.[12]

Independently of the controversial results, studies finally agreed that a positive self-esteem may help children with ADHD to cope with failures or difficulties in everyday life, thus emphasizing the importance of self-esteem for performance and outcomes in ADHD patients. We hypothesized that children's HRQoL can mediate the impact of ADHD severity on family burden. So, we aimed to study Quality of life, Self Esteem, and quality of sleep and its corelation in adolescents with ADHD.

II. MATERIAL AND METHODS

This study was undertaken as a cross sectional study and was conducted in Department of psychiatry at a tertiary care medical college and hospital, for a duration of 1 year on 100 adolescents diagnosed as attention deficit/hyperactivity disorder (ADHD) as per the DSM V criteria and age matched 100 healthy adolescents after taking consent and patients suitable to the inclusion criteria were recruited for this study after approval of ethical standards from the institution.

Study population: 200 adolescents including healthy controls, Adolescents diagnosed as attention deficit/hyperactivity disorder (ADHD)

Study Design: Cross sectional study.

Study location: Department of Psychiatry at a tertiary care hospital and college

Sample Size: 200 patients; having 2 groups, patients diagnosed with ADHD and a healthy group from community age matched as per the study

Group I: 100 Healthy controls

Group II: 100 adolescents diagnosed with ADHD.

Clinical diagnosis of ADHD was made by the Psychiatrist based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria.[13]

Inclusion Criteria –

- Adolescents age 12-18 years of age
- Consenting for participation
- As per DSM V diagnosed as ADHD
- No any other psychopathology (psychiatric diagnosis)
- No any medical illness

Exclusion criteria –

- Adolescents suffering from any other psychiatric disorder
- Any other comorbid medical illness
- On any medication for sleep problems
- Intellectual disability

Quality-control measures to check data completeness and consistency

Local and English language were preferred to ask the screening questions during the initial screening of patients with valid identity proof and also recorded the required demographic data.

Procedure methodology

Preliminary data:

After written informed consent form had been obtained, detailed history of the presenting symptoms and their onset was recorded. Relevant details pertaining to study of all the patients were obtained (like demographic details, age of patient, clinical details) was noted on patient proforma.

DSM-5® DIAGNOSTIC CRITERIA FOR ADHD IN ADULTS[14]

All criteria must be met for a diagnosis of ADHD in adults*:*

1. Five or more symptoms of inattention and/or ≥5 symptoms of hyperactivity/impulsivity must have persisted for ≥6 months to a degree that is inconsistent with the developmental level and negatively impacts social and academic/occupational activities.
2. Several symptoms (inattentive or hyperactive/impulsive) were present before the age of 12 years.
3. Several symptoms (inattentive or hyperactive/impulsive) must be present in ≥2 settings (eg, at home, school, or work; with friends or relatives; in other activities).
4. There is clear evidence that the symptoms interfere with or reduce the quality of social, academic, or occupational functioning.
5. Symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder, and are not better explained by another mental disorder (eg, mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication, or withdrawal).

The Children's Sleep Habits Questionnaire (CSHQ): The CSHQ is a retrospective, 33-item parent questionnaire that has been used in a number of studies to examine sleep behavior in young children. The CSHQ includes items relating to a number of key sleep domains that encompass the major presenting clinical sleep complaints in this age group: bedtime behavior and sleep onset, sleep duration, anxiety around sleep, behavior occurring during sleep and night awakenings, sleep-disordered breathing, parasomnias, and morning waking/daytime sleepiness. Parents are asked to recall sleep behaviours occurring over a "typical" recent week. Items are rated on a 3-point scale: "usually" if the sleep behaviour occurred five to seven times/ week, "sometimes" for two to four times/week, and "rarely" for zero to one time/week. Some items were reversed to consistently make a higher score indicative of more disturbed sleep (Owens, Spirito, & McGuinn, 2000).[15] The validity and the reliability of English version of CSHQ–Abbreviated Form is studied by Malhi P et al. (2008).[16]

The Pediatric Quality of Life Inventory (PedsQL) is a modular instrument designed to measure health-related quality of life (HRQOL) in children and adolescents ages 2 to 18 years (Varni, Seid, & Rode, 1999).[17] PedsQL also includes the Physical Health Summary Score (eight items; same as the Physical functioning scale) and the Psychological Health Summary Score (15 items; the mean of the sum of items included in the Emotional, Social,

and School functioning scales). Parents and children completed the scale. Varni JW et al studied the reliability and validity of English version (Varni JW et al, 2001).[18]

Assessment of Self-Esteem

To assess the self-esteem all the clinical and control children and adolescents completed the Self-Esteem Multidimensional Test (TMA).[19] The TMA is based on a hierarchical model of self-esteem: it comprises six self-esteem dimensions (Personal, Skills, Emotional, School, Family, Body, Total) that partly overlap each other and partly with the core global self-esteem. The test consists of six groups of 25 items for each dimension explored and each item requires one of 4 possible answers: absolutely true, true, not true, absolutely not true. The test provides scores in six rating scales corresponding to the six self-esteem dimensions (Personal, Skills, Emotional, School, Family, Body, Total) and a global self-esteem related score. The average scores for self-esteem in the normative sample are between 85 and 115.

Statistical analysis

Data were analysed with SPSS version 23. The normality of data was first tested with chi square test. Descriptive analyses (frequency, percentage, mean, and standard deviation) were conducted to describe the variables. For parametric data, the two groups were compared with Student t test. P value <0.05 will be considered as the level of significance.

III. RESULTS

Table 1: Demographic details

Parameters	**ADHD (n=100)**	**Controls (n=100)**	**p-value**
Mean Age (years)	12.86±2.4	12.94±2.7	0.687
Male	62 (62.0%)	66 (66.0%)	0.421
Females	38 (38.0%)	34 (34.0%)	

Table 2: TMA Subscales in the Study Population [To assess the self-esteem all the clinical and control children and adolescents completed the Self-Esteem Multidi-mensional Test (TMA) (Bracken BA. Test di Valutazione dell'Autostima. Trento: Edizioni Erikson 1993)]. The test provides scores in six rating scales corresponding to the six self-esteem dimensions (Personal, Skills, Emotional, School, Family, Body, Total) and a global self-esteem related score. The average scores for self-esteem in the normative sample are between 85 and 115.

Groups	**TMA Subscales**						
	Personal	**Social**	**Emotional**	**Academic**	**Intellectual**	**Moral**	**Total**
ADHD (n=100)	92.9±14.9	89.2±17.3	94.5±12.8	89.5±16.1	91.6±10.5	98.4±14.3	91.1±14.4
Controls (n=100)	105.6±15.2	101.3±14.9	106.3±10.9	105.1±15.3	106.3±11.6	114.2±21.2	107.2±12.2
p-value	**0.000**	**0.003**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**

Table 3: Quality of sleep and ADHD Sleep problems (higher score = poorer sleep quality)

Sleep quality	**ADHD (n=100)**	**Controls (n=100)**	**p-value**
Presence of sleep	84 (84.0)	61 (61.0)	**<0.001**

problems			
Absence of sleep problems	16 (16.0)	39 (39.0)	

Table 4: Mean and Standard Deviation Results of PedsQL (Parent) Scores {Items on the PedsQL Generic Core Scales are reverse scored and transformed to a 0-100 scale. Higher scores indicate better health related quality of life:}

PedsQL subscales (parents)		**ADHD with sleep problems (n=84)**	**Controls with sleep problems (n=61)**	**p-value**
Parents	**Physical health**	71.1±19.2	75.5±16.7	0.153
	Psychosocial health	62.0±15.4	79.6±10.8	**<0.001**
	Total	66.6±15.3	77.6±10.2	**<0.001**
Child	**Physical health**	74.2±18.4	82.6±13.3	**0.003**
	Psychosocial health	65.8±16.1	79.2±9.9	**<0.001**
	Total	68.9±15.7	80.7±10.4	**<0.001**

IV. DISCUSSION

ADHD is one of the most common neurobehavioral disorders presented to pediatric mental health professionals, affecting one of 20 children and adolescents worldwide.[20] In addition, the syndrome often occurs with other psychiatric conditions and attendant symptoms. According to parent reports, as many as 73% of children with ADHD suffer from sleep problems.[21] Frequently reported sleep complaints include difficulties initiating and maintaining sleep with increased night awakening.[22]

The concept of quality of life (QoL) has been interpreted in several ways. The most common and used concept of QoL is that is an individual's perception of the effect of health condition on different life aspects including physical, mental, and psychosocial functioning.[23] Although QoL is subjective, children were previously thought that they have not the ability to describe their QoL. However, self-report is now mandatory for children as they become having an important role in the process of assessing and understanding their health and QoL according to their capabilities and limitations. However, for both self-reports and observer-based reports, usually the parents are important for the understanding of the child's perception as well as the family's perception of their child's QoL.[11]

The aim of the present study was to explore the relationship of sleep quality, self-esteem, and HRQoL in adolescents with ADHD on the basis of self and proxy ratings. In our study the difference in mean age and the gender among the ADHD adolescents and controls was statistically insignificant ($p>0.05$) with male predominance. Our findings were consistent with the findings of **Yürümez E and Kılıç BG[24]** who reported insignificant differences between subtypes for socio-demographical features (age, BMI, age and education level of parents, number of sibling ($p>0.05$). **Thoma VK et al[25]** who reported that Gender, age, and IQ score are studied respectively. In the matched sample, there were no significant differences in gender distribution, mean age, or IQ (all $p>0.20$).

For the association between self-esteem and ADHD TMA test was used which provides scores in six rating scales corresponding to the six self-esteem dimensions (Personal, Skills, Emotional, School, Family, Body, Total) and a global self-esteem related score. The average scores for self-esteem in the normative sample are between 85 and 115. In in present study the score for all six parameters were significantly lower in ADHD group than controls ($p<0.05$). Our findings were in agreement with the findings of **Mazzone L et al**[26] who did a comparison between total ADHD patients and controls, by Student t-test, showed significantly lower self-esteem scores on all TMA Subscales (Personal, Skills, Emotional, School, Family, Body and Total) in the ADHD group. Among the ADHD sample, variance analysis indicated a significant difference in TMA Total Subscale ($p=.049$).

Previous studies showed that children and adolescents suffering from ADHD have low levels of social skills and self-esteem as compared to the general population[27] and these findings are consistent with other studies indicating that also adults with ADHD continue to have problems in many areas of functioning[28],[29], thus inferring the hypothesis that social functioning and self-esteem may play a role on future outcomes in ADHD.[30] In line with this, our findings show that patients with ADHD have significantly lower scores on all the administered self-esteem rating scales (personal, skills, emotional, school, family, body) compared to healthy controls, and these results are particularly relevant in light of the crucial importance of social functioning and self-esteem for healthy functioning, that is generally impaired in ADHD individuals, during development. The ability to successfully interact with peers, one of the most important aspects of social development for all ages[31], can also be impaired in ADHD children and this deficit in peer relationships can compromise interpersonal success and happiness[30] thus leading to a low self-esteem.

On the basis of quality of sleep between ADHD and controls the frequency of sleep problems in control group is found as 61.0% and 84.0% in ADHD group and the difference was statistically higher in ADHD group ($p<0.01$). Our findings were comparable to the findings of **Yürümez E and Kılıç BG**[24] who did a study on the relationship between sleep problems and quality of life in children with ADHD and reported that in control group absence of sleep was in 61.3% and 84.8% in ADHD group ($p=0.002$). Other previous studies on sleep in ADHD also revealed increased overall prevalence of sleep-related complaints in young patients with ADHD.[32]

El-Monshed AH et al9 findings indicate that children with ADHD have high rates of sleep disturbances include bedtime resistance, difficulties with sleep onset and maintenance, parasomnias, sleepwalking, sleep anxiety, and sleep-disordered breathing. These results reflect findings of prior studies indicating that children with ADHD experience elevated frequencies of sleep disturbances when compared with researches on normative samples. Possible explanations could be given for these results by that children with ADHD are mostly inattentive, distracted easily by any stimuli, and find difficulties in stopping and neglecting interruptions, and then in going to bed. Thus, they're in bed, it is difficult to calm their mind or stopping talking about day's event and being relaxed enough to sleep normally. In addition, prior researches thought that one reason of sleep disorders is because ADHD may corrupt circadian rhythm, the ideal wake cycle of sleep.[33]

We used PedsQL (Parent and child) Scores for quality of life and in these items on the PedsQL Generic Core Scales are reverse scored and transformed to a 0-100 scale. Higher scores indicate better health related quality of life. We observed that in both parent and child rating score the difference was significant (i.e., lower score for ADHD for both physical and

psychological health). Our findings were in accordance with **Yürümez E and Kılıç BG**[24] who reported that ADHD and control group were compared by PedsQL scores completed by children and parents. PedsQL completed by parents, and physical health (p=0.012), psychosocial health (p=0.001), total score (p=0.001), and PedsQL completed by children, and physical health (p=0.009), psychosocial health (p=0.001), and total score (p=0.001), are found to be different. It is shown that quality of life of ADHD group is worse than control group.

Similarly, **Escobar R et al**[34] conducted a study consisting of 237 children between the ages of 6 and 12, where 124 of them had ADHD, 93 of them had asthma, and 120 were healthy subjects. In this study, QoL assessment was examined with the Child Health Questionnaire (CHQ) scale. The results indicated that children with ADHD showed impaired psychosocial functioning and an impaired psychosocial and physical functioning. Differences between the ratings for children with ADHD and asthmatic children were smaller than that of the ADHD group and the healthy children.

V. CONCLUSION

Children with ADHD have higher rates of sleep problems include bedtime resistance, difficulties with sleep onset and maintenance, sleep anxiety, parasomnias, sleepwalking, and sleep-disordered breathing. These sleep disorders are strongly associated with poorer physical and psychosocial quality of life. Low self-esteem and self-perception were strongly associated with depression. Ideally, representative samples should be assessed longitudinally and objective data should be measured in addition to subjective reports.

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