

GENDER DIFFERENCES IN EXTERNALIZING AND INTERNALIZING BEHAVIORS AMONG CHILDREN AND ADOLESCENTS WITH CONGENITAL HEART DISEASE

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ABSTRACT

To determine gender differences among Children and Adolescents with Congenital Heart Disease (CHD) in Pakistan. A comparative group design was used to study variables. The study was conducted at the Faisalabad Institute of Cardiology from, January 2021 to April 2022. A sample of 323 children and adolescents diagnosed with cyanotic and A cyanotic CHD was studied to assess the internalizing and externalizing problems in different types of CHD. The strength and Difficulty questionnaire was used to measure the emotional behavioral issues. Parent-reported form for children below 7 years of age and self-report for above 7 years was used. Detailed history and demographic was taken. The results explained that 65% of the CHD population is in the clinical range of externalizing and internalizing problems. The comparison of gender mean difference shows that the male population have more externalizing problems as compared to females ($p < .05$). Whereas no difference was found in internalizing problems in both gender while males have more externalizing issues and females are better in prosocial behavior as compared to male counterparts. Children and adolescents with cyanotic CHD have more clinical range of emotional and behavioral issues ($p < .01$). Children and adolescents now have a long life as compared to previous decades but with this growing age and having a congenital condition they are having problems in their psychological health which is in need of assessment and repair.

Keywords: Emotional Behavioral Issues, Externalizing, Internalizing, Gender.

INTRODUCTION

More than 95% of children with congenital heart defects (CHD) now cross their childhood, there is an increase number of adults with congenital heart disease estimated in Pakistan with 60000 children born with CHD in each year in Pakistan. With major developments in the evaluation and treatment of congenital heart disease, greater life expectancy is achieved. A vast proportion of patients experience these problems which vary from mild to life-threatening, CHD requires lifelong medical surveillance is required (Verheugt et al., 2008).

The congenital illness usually has an impact on the health and well-being of any individual. An illness of early onset with a need for frequent hospital visits, admissions, or different diagnostic and therapeutic procedures creates an adverse effect on the social and emotional health of children and adolescents (Dekker& Koot, 2002).

Congenital heart disease (CHD) has several birth defects, which disturb the normal functioning of the heart These defects can start from abnormal development of the heart's or major blood vessels' structures. CHD can present at the time of birth but in many cases, it can be detected in the prenatal environment. Many studies with children and adolescents have revealed increased life expectancy and

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normal growth (Dahlawi & Milne 2020). The global mortality rate significantly reduced between 1990 to 2010. These contributing factors now resulted in a shift within future research. Now the researchers focused to sort out the ways to improve the paired emotional behavioral issues and quality of life in these children and growing adolescents (Iloaano et al., 2012).

With this increased focus the assessment was around the psychosocial functioning of CHD children and adolescents. The prime objective of all clinical care was not only to achieve life expectancy but research shifted to explore more possible psychological care and improved quality of life. There is no consensus among different researchers on assessing psychology but they are sorting out many ways to move forward. Many studies started to explore emotional behavior problems that can reduce their psychological and cognitive functioning as compared to healthy children of their age (Miatton, 2007).

Children and adolescents with CHD experience challenges in their all-over development. The congenital conditions can be affected by several factors that contribute to severe emotional and behavioral issues, that make a hindrance in their normal development, socialization, or future life. Such behaviors include aggressive or destructive behavior, temper tantrums, and social issues (Sarvass, 2013). Follow-up studies investigated psychosocial outcomes and reported contradictory results in different cultures. Moreover, very few studies have evaluated the impact of CHD on the psychological health of the Pakistani population. Therefore, the following study assesses the relevant psychosocial problems in the CHD population.

The major objective of the current study is to explore the level and nature of emotional behavioral issues in local care hospital. As per our knowledge, it is the first study of its kind where the rate of CHD is quite higher than its neighboring countries. The advancement in pediatric cardiac care units has made it possible for the long-term life of the CHD population. But with their increased life-years along with a congenital condition created many hurdles in their normal psychosocial functioning and daily routine. The assessment of these issues can help clinicians tackle them in a better way. Furthermore, this assessment helps to pave the way for their psychosocial care and improved quality of life.

PATIENTS AND METHODS

This study, based on a cohort was completed in 10 months. This study was conducted in a tertiary care hospital, FIC (Faisalabad institute of Cardiology). The initial approval was forwarded to the Ethical committee review board from FIC and after this approval, the university IRB approval was taken. 300 children and adolescents were involved in the study. The standardized tool, strength and difficulty questionnaire was used in the study. The Strengths and Difficulty Questionnaire (SDQ) (Goodman, 2009) is a valid and reliable measure for assessing the mental health status of people in the age range 2 to 18. 4500 clinical and academic studies used SDQ and over 5 million assessments of young people have been carried out on a single website since 1998. It takes 3 to 5 minutes to complete this scale. SDQ comprises 25 items based on 5 subscales for which each subscale score ranges from 0 to 10. Children with different types of CHD were recruited from the prospective cohort. A separate Demographic sheet was attached to record all the demographic details of children and adolescents with CHD. The data of the study were collected from April 2021 to December 2021. The informed consent from parents, as well as a self from the participants above 16, was taken and all the rights were given to the population as they can withdraw from the study at any time.

RESULTS

Table 1: Demographic characteristics of CHD children and adolescents(n=323)

Variables	N	%	Mean	SD
Gender(child)				
Male	169	51.8	4.26	
Female	157	46.2	4.20	
Age				
6-9	146	44.7	10.11	4.1
9- 13	82	20.6		
14-17	98	30		
Diagnosis				

PS	23	7.1		
ASD	76	23.3		
AVSD	41	12.6		
PDA	31	9.5		
VSD	73	22.3		
TGA	6	1.8		
TOF	76	23.4		
Medication Adherence			.89	.31
Yes	289	88.7		
No	37	11.3		

Table No. 2 Mean differences between Externalizing and Internalizing problems in different types of CHD

Diagnosis	Externalizing M(SD)	Internalizing M (SD)
PS	9.56 (2.10)	7.95 (3.06)
ASD	9.11 (3.45)	7.82 (3.23)
AVSD	9.68 (2.90)	9.78 (3.92)
PDA	8.25 (2.88)	7.12 (2.60)
TGA	7.00 (1.78)	7.66 (3.72)
TOF	9.07 (2.52)	8.96 (2.99)
VSD	9.32 (2.76)	8.30 (2.98)

Note= PS (pulmonary valve stenosis), ASD (atrial septal defects), AVSD (atrioventricular septal defects), PDA (patent ductus atrophicus), TGA (dextrotransposition of great artery), TOF (teratology of fallout), VSD (ventricular septal defect)

Table3 : Prevalence of Emotional behavioral issues as per gender and diagnosis of CHD population

		EBP			
Gender		Non clinical	borderline	Clinical	Total
	female	42	44	71	157
	male	23	57	89	169
Total		65	101	160	326

Note=EBP emotional behavioral problem, Non-clin(non-clinical range of EBP), Borderline(borderline range of EBP), Clinical(clinical range of EBP)

Figure 1: Gender differences in emotional behavioral issues in CHD Children and Adolescents

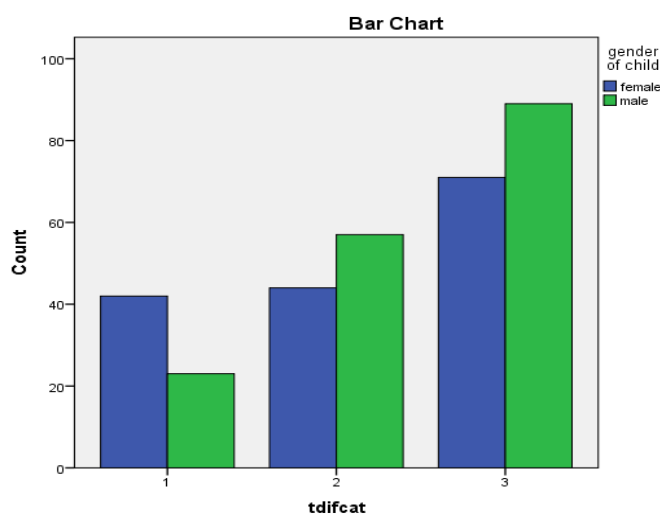
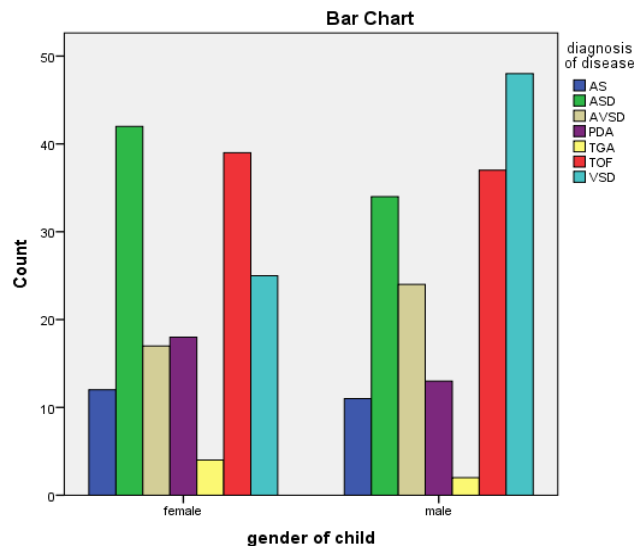


Table 4 : Gender difference in diagnosis of CHD among children and adolescents

Gender	diagnosis of disease							Total
	AS	ASD	AVSD	PDA	TGA	TOF	VSD	
female	12	42	17	18	4	39	25	157
male	11	34	24	13	2	37	48	169
Total	23	76	41	31	6	76	73	326

Figure 2: Gender difference in diagnosis of CHD among Children and Adolescents

Out of 326 children and adolescents 51.8() were males and 46.2() were females. The male-to-female ratio was 1.2:1. Most of the children were below the age of 9. Both cyanotic and cyanotic patients were present in the sample. Most prevalent types of CHD were ASD (Atrial septal defect), VSD (ventricular septal defect), and TOF (teratology of fallout) which were 23.3%,22.3, and 23.4 respectively.88.7 % of patients were taking their treatment and still on medicine while the other 11.3% were not on medication as they have come to their follow-up for symptomatic issues arise whenever. Out of 326,160 (49.1%), children and adolescents were above the clinical cutoff of emotional behavioral issues. While 101(31.1%) children and adolescents were at the borderline level in emotional behavioral difficulties.

Figure 1 explains that male children and adolescents have more emotional behavioral issues than the female population. Whereas Figure 2 explains that both genders have same ratio in prevalent CHD type. It explains that CHD diagnosis ratio is equal in male and female children and adolescents

DISCUSSION

Congenital illness creates significant impairment everyday functioning of children and adolescents with CHD which requires complete medical care and suitable interventions for day-to-day activities. In a study where a researcher explored the difference between healthy children and other chronically ill children, the pediatric cardiac patients displayed more poor physical and psychosocial health

This study serves as the first of its kind for exploring the relative externalizing and internalizing emotional behavioral issues in children and adolescents with CHD. Previously Gender disparities have been documented extensively in various fields of cardiovascular disease such as ischemic heart disease, heart failure, and stroke. The study serves this purpose in regard with CHD population.

The results almost all types of CHD showed higher mean for externalizing problems as compared to internalizing problem. The long-term illness and physical weakness experienced by this population create hindrances to their normal mental health and well-being. Their condition limits them from normal daily, school, and social functioning. Gender has an effective distinct role in these problems. The resultant anxiety and stress create many emotional and behavioral issues which can be varied with gender in this population (Dahlawi, 2020).

When investigating the relationship between the presence of emotional behavioral difficulties it reveals that the male CHD population showed greater problems as compared to female CHD children and adolescents. Although the parallel prevalence rate of CHD in both gender the difference depict that male have more relative stress due to hurdles and hindrances in the normal functioning of life. Previous studies also demonstrate this trend. In post-surgical treatment group Boys unlike girls demonstrated more psychosocial issues (23.8% vs 12.6%) as compared to their female counterparts (Alkan, et al., 2018; Abasse, 2020; Denniss, 2019).

Males children and adolescents pose a greater risk as their number is the greater from clinical cutoff of EBP. A study compared four CHD diagnostic groups of different CHD severities, they found that children and adolescents who were males revealed more social (mean 4.4) and externalizing problems (mean 9.0) than female children and adolescents (mean 2.2 and 5.2, respectively).

In another study of infants of 36 months with different variations in CHD diagnosis, infants did not differ in showing any risks of developing emotional problems, however, In growing time they demonstrated more behavioral issues with different modalities in their severity. They are 60% higher risk of emotional problems Hence, these results suggest that children and adolescents with high disease severities develop more problems in their later life than lower disease severities (Clancy, 2020; Kovack, 2018).

Male and female children and adolescents' ratio is somehow different in different types of CHD. In TOF and VSD female ratio is greater while other types have more male patients as compared to females. Age gender and parent-child interaction, as well as socio-demographic factors like socioeconomic condition parental education, family system, and size of family, also contribute to these issues (Clancy, 2020; Kovack, 2018). data discussed in this article indicate that men and women born with a heart defect differ in mortality, morbidity, and, to some extent, the way they are managed. Whether this relates to inherent biological differences, the smaller size of women's vessels, or intrinsic genetic differences remains uncertain (Verheugt et al., 2008)

This study result was also explaining that the more severe or complex the diagnosis the more internalizing and externalizing issues the population was suffering. It is also showing that the male population has more issues. The mean differences were showing that all types of CHD showed greater externalizing problems as compared to internalizing issues except TGA and AVSD.

In a developing country like Pakistan, the etiology of emotional behavioral issues along with the main disease is manifold. The demographic characteristics of financial Burdon, accessibility, and affordability of health services, family monthly income living environment, and child characteristics are also important. Some previous studies in Pakistan showed a high prevalence of anxiety and depression, especially in women and in the rural population they also concluded that female gender, poor academic performance and poor social support show worse psychosocial adjustment and quality of life (Mckusker, 2007; Azim, 2017).

Implications for practice

It is anticipated that the findings of current research provide help to Healthcare Professionals in gaining new knowledge and paying particular attention to the psychosocial functioning of the growing CHD population. It also them to refer and seek appropriate support for better psychological health. Future research will potentially inform the development of future preventive interventions, such as support groups of behavioral and emotional care for CHD children and adolescents with the special reference to their gender.

CONCLUSION

All previous studies in Pakistan mainly relied on the reporting of prevalence and level of CHD but this study assesses behavior and emotions relevant to their health-related quality of life. Furthermore, the investigation around the relationship between gender and behavioral and emotional issues also assessed CHD which was needed earlier. It was identified that there is a need for future qualitative studies that explore in-depth these issues in CHD and how their behavior and emotions, effecting the younger population.

Limitations The study sample was based on a cohort from a tertiary care hospital as it was the initial part of an RCT study.

Authors contribution AH; prepared the manuscript RK; supervised the research and critical review AM; reviewed data collection AR data collection support

Conflict of interest The study has no conflict of interest to be cleared by any author.

REFERENCES

- Azim, K., Sheikh, A. M., Khokhar, M. M., Kanwal, A., Akbar, T., & Masood, S. (2021). Anxiety And Depression In Children And Adolescents With Congenital Heart Disease Before And After Surgical Intervention Period. *PAFMJ*, 71(6), 2049-52.
- Clancy T, Jordan B, de Weerth C, Muscara F. (2020). Early emotional, behavioural and social development of infants and young children with congenital heart disease: a systematic review. *Journal of Clinical Psychology in Medical Settings*. 27(4):686-703.
- Dahlawi N, Milnes LJ, Swalloe V. (2020). Behaviour and emotions of children and young people with congenital heart disease: A literature review. *Journal of Child Health Care*, 24(2):317-32.
- Dekker MC, Koot HM, Ende JV, Verhulst FC. (2002). Emotional and behavioral problems in children and adolescents with and without intellectual disability. *Journal of Child Psychology and Psychiatry*, 43(8):1087-98.
- Denniss, D. L., Sholler, G. F., Costa, D. S., Winlaw, D. S., & Kasparian, N. A. (2019). Need for routine screening of health-related quality of life in families of young children with complex congenital heart disease. *The Journal of pediatrics*, 205, 21-28.
- du Marchie Sarvaas, G. J., Utens, E. M., & Dalinghaus, M. *Emotional and behavioral problems in children with dilated cardiomyopathy*. Children with Dilated Cardiomyopathy, 107.
- Finkel, G. G., Sun, L. S., & Jackson, W. M. (2022). Children with Congenital Heart Disease Show Increased Behavioral Problems Compared to Healthy Peers: A Systematic Review and Meta-Analysis. *Pediatric Cardiology*, 1-8.
- Goodman, A., & Goodman, R. (2009). Strengths and difficulties questionnaire as a dimensional measure of child mental health. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(4), 400-403.
- Khaled EM. (2021). Iron Deficiency and Behavioral Disorders in Children with Congenital Heart Disease. *Saudi J Med*, 6(7):198-205.
- Kovacs, A. H., Brouillette, J., Ibeziako, P., Jackson, J. L., Kasparian, N. A., Kim, Y. Y., ... & American Heart Association Council on Lifelong Congenital Heart Disease and Heart Health in the Young; and Stroke Council. (2022). Psychological outcomes and interventions for individuals with congenital heart disease: a scientific statement from the American Heart Association. *Circulation: Cardiovascular Quality and Outcomes*, 15(8), e000110.
- Larsen SH, McCrindle BW, Jacobsen EB, Johnsen SP, Emmertsen K, Hjortdal VE. (2010). Functional health status in children following surgery for congenital heart disease: a population-based cohort study. *Cardiology in the Young*, 20(6):631-40.
- Lozano, R., Naghavi, M., Foreman, K., Lim, S., Shibuya, K., Aboyans, V., ... & Remuzzi, G. (2012). Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*, 380(9859), 2095-2128.
- McCusker, C. G., Doherty, N. N., Molloy, B., Casey, F., Rooney, N., Mulholland, C., ... & Stewart, M. (2007). Determinants of neuropsychological and behavioural outcomes in early childhood survivors of congenital heart disease. *Archives of disease in childhood*, 92(2), 137-141.
- McWhorter LG, Christofferson J, Neely T, Hildenbrand AK, Alderfer MA, Randall A, Kazak AE, Sood E. (2022). Parental post-traumatic stress, overprotective parenting, and emotional and behavioural problems for children with critical congenital heart disease. *Cardiology in the Young*, 32(5):738-45.
- Miatton, M., De Wolf, D., François, K., Thiery, E., & Vingerhoets, G. (2007). Behavior and self-perception in children with a surgically corrected congenital heart disease. *Journal of Developmental & Behavioral Pediatrics*, 28(4), 294-301.
- Mohsen AA, Kassem MG, Antonios MA. (2021). Psychosocial assessment and quality of life assessment in children with congenital heart in a developing country. *Egyptian Pediatric Association Gazette*, 69(1):1-7.
- Sertçelik, T., Alkan, F., Sapmaz, Ş. Y., Coşkun, Ş., & Eser, E. (2018). Life quality of children with congenital heart diseases. *Turkish Archives of Pediatrics/Türk Pediatri Arşivi*, 53(2), 78.

- Verheugt, C. L., Uiterwaal, C. S. P. M., van der Velde, E. T., Meijboom, F. J., Pieper, P. G., Vliegen, H. W., van Dijk, A. P. J., Bouma, B. J., Grobbee, D. E., & Mulder, B. J. M. (2008). Gender and Outcome in Adult Congenital Heart Disease. *Circulation*, 118(1), 26–32. <https://doi.org/10.1161/CIRCULATIONAHA.107.758086>
- Werninger, I., Ehrler, M., Wehrle, F. M., Landolt, M. A., Polentarutti, S., Valsangiacomo Buechel, E. R., & Latal, B. (2020). Social and behavioral difficulties in 10-year-old children with congenital heart disease: prevalence and risk factors. *Frontiers in pediatrics*, 8, 604918.