

## IMPACT OF SURGERY ON QUALITY OF LIFE (QOL) IN PATIENTS WITH STRUCTURAL HEART DISEASE

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### ABSTRACT

**Background:** Structural heart disease is one of the most commonly occurring congenital disorders with about 0.8% - 1.2% of live births worldwide. Despite the tremendous progress in field of cardiology, majority of this growing population with CHD even after the surgery continue to face life-long challenges and are at risk for having a poor (QoL).

**Objectives:** To evaluate the impact of surgery on QoL in patients with structural heart disease.

**Materials:** This Quasi experimental study was conducted in Rawalpindi Institute of Cardiology Rawalpindi. From July 2019 to June 2020. We included 76 children and adolescents of both genders with one of their parents after consent. Demographic and clinical data was recorded on the preset Performa. The QoL was accessed by using Urdu version of World Health Organization Quality of Life Brief Version (WHOQOL-BREF) before and one month after surgery. Data was analyzed on SPSS 20 and p value of <0.05 was taken as significant.

**Results:** The mean age of participant (n=76) children and adolescents is 14.5 (14.5 ± 3.3) years. Out of total, 52.6% were females while 47.4% were males. Most of the patients had VSD, 26(34 .2%) followed by TOF 12(15 .7%) and ASD 9(11 .2%). Valvular heart disease (Mitral, Aortic) was found in 8 (10. 5%) and 5(6 .5%) cases respectively the individual parameters of WHO QoL scale were compared in pre- and post-surgical period. Further the parameters of WHO QOL scale were divided into sub categories of physical health, psychological wellbeing, social interaction and environmental health for analysis. Results revealed that physical health, psychological wellbeing, social interaction and environmental health all considerably improved in the post intervention period (p value 0.008, <0.001, <0.001 and 0.001 respectively). The overall QoL of patients also improved significantly (p value 0 .001).

**Conclusion:** There was significant improvement in physical health, psychological wellbeing, social interaction and environmental health in the post intervention period. Overall QoL in the postoperative period was also improved.

**Keywords:** Structural heart disease, Quality of life, WHO QOL BREF,

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### INTRODUCTION

Congenital heart disease (CHD) is one of the most commonly occurring congenital disorders with about 0.8% - 1.2% of live births worldwide.<sup>1</sup> Before 1950s, severe CHD was considered as fatal disease all over the world.<sup>2</sup> Fortunately, advances in surgical and post-operative support techniques have drastically reduced the mortality and most of the patients are now expected to reach adulthood without any severe physical

impairment.<sup>3</sup> Today approximately 1.3 million children are living with a CHD worldwide<sup>4</sup> and 90% of them can survive into adulthood.<sup>5</sup> According to one estimates about 2800/million adults are currently living with CHD.<sup>6</sup> Since 1995, almost 9 out of 10 CHD child may reach adulthood.<sup>7</sup> Despite the tremendous progress in field of cardiology, majority of this growing population with CHD even after the surgery continue to face life-long challenges and are at risk for having a poor (QOL).<sup>8</sup> QOL is a broader term and it seems to depend on multiple factors, good health is directly related to it. In children with CHD to a limited extent the QOL is mainly determined by their heart defect, both palliative and corrective surgery always aims to improve QOL.<sup>9</sup> It is

defined as the standard of health, comfort, and happiness experienced by an individual integrating physical, emotional, and social well-being<sup>10</sup> while health related QoL (HRQoL) reflects the patient's perception of the impact of the disease and its management on their life.

The assessment of QOL provides a complete picture of the health of the individual. It may help in the recognition of physical and psychosocial issues and is an important tool in assessing consequences of chronic conditions. There is controversial data regarding the QOL in children with CHD and impact of intervention on this. Some research has established that children with CHD have better QOL<sup>11</sup> than general population while other reported an impaired QOL in these children.<sup>12</sup> However, most studies have mainly focused on teenagers or adults and very little data is available in young children.<sup>13</sup> The aim of this research was to assess QOL in children with CHD pre and post-surgery. The objective of this study was to evaluate the impact of surgery on QoL IN PATIENTS with structural heart disease.

## METHODS

This Quasi experimental study was conducted in Pediatric cardiology department, Rawalpindi Institute of Cardiology Rawalpindi. From July 2019 to June 2020. Ethical approval was taken from hospital review board. Total 76 patients of age 8 to 20 years were included. Patients of both sexes having structural heart disease and admitted for surgery were selected. Patients who do not consent having co morbidities and those having difficulty to comprehend were excluded.

The sample size was calculated using WHO calculator with confidence level of 95% alpha error 5 % mean HRQoL (socializing and schooling) in children with CHD = 90.0, mean HRQoL in healthy control = 100.0, sigma of 22.0 the sample size comes out to be 76 children with CHD.<sup>14</sup>

The patients were assessed according to WHOQOL BREF protocol. The WHOQOL BREF<sup>14</sup> assesses QOL in both patients and controls. It consists of 26 item Likert type scale with 1 to 5 ratings. Some of the questions assess general QOL while the others four dimensions of QOL: psychological (questions 5, 6, 7, 11, 19, and 26), environmental (questions 8, 9, 12, 13, 14, 23, 24, and 25),

social (questions 20, 21, and 22) and physical (questions 3, 4, 10, 15, 16, 17, and 18). Average score for each parameter is calculated and scaled from 0 to 100. Variables were assessed based on descriptive statistics including mean, standard deviation, median, lower and upper quartiles. SPSS 20.0 was used to analyze the data. The categorical variables (sex, age and congenital anomalies) were calculated as frequency and percentages. The mean levels of individual parameters of WHO QOL BREF scale was compared by using paired samples t-test.

## RESULTS

In this study, 76 cases with congenital heart diseases were enrolled with the primary aim of assessing QoL parameters in the pre-intervention and post intervention periods. The mean age was 14.5 years. Most of them were 15.1 year or above 40 (52.6%). Female gender 40 (52.6%) was predominant in this study. Most of the study cases had congenital anomaly of VSD 26 (34.2%), followed by TOF 12 (15.7%) and ASD 9 (11.2%). Valvular heart disease (Mitral, Aortic) was found in 8 (10.5%) and 5 (6.5%) cases respectively.

The individual parameters of WHO QoL scale were compared in both periods according to mean values. Though most of the QOL parameters improved in the post intervention period, there were few which remained similar to that of pre intervention period.

Further the parameters of WHO-QOL scale were divided into sub categories (physical health, psychological health, social relationships and environmental health). All the parameters improved in the post intervention period (p-value, 0.008, <0.001, <0.001 and 0.001 respectively). The overall QOL of patients with Structural heart disease also improved significantly (p-value, 0.001). (Table 1)

A stratified analysis was done to see any variation between the demographic characteristics and domains of QOL. The improvement in physical health, social integration and environmental health was found similar among both genders. Similarly, no significant difference was witnessed in these domains when age wise stratified analysis was done. Further details regarding QOL scale can be seen in table 2.

Table 1: Comparison of transformed means of four domains of WHO\_QOL scale between pre and post intervention groups (n=76)

	Physical Health (mean ± SD)	Psychological Health (mean ± SD)	Social Relationships (mean ± SD)	Environmental Health (mean ± SD)	Overall QOL (mean ± SD)
Pre-intervention	22.7 ± 4.8	15.9 ± 1.9	8.0 ± 1.0	23.7 ± 3.3	70.4 ± 9.1
Post intervention	25.4 ± 3.6	17.8 ± 1.5	8.3 ± 0.9	25.3 ± 3.1	75.1 ± 5.5
<i>p-value</i>	0.008	<0.001	<0.001	<0.001	<0.001

Table 2: Comparison of demographic characteristics according to four domains of WHO-QOL scale (n=76)

	Physical health (mean ± SD)		Psychological health (mean ± SD)		Social integration (mean ± SD)		Environmental integration (mean ± SD)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Sex								
Male (n=36)	22.0 ± 4.5	25.7 ± 4.1	17.6 ± 2.8	16.8 ± 2.7	7.9 ± 1.1	8.1 ± 1.0	25.0 ± 3.6	26.5 ± 3.5
Female (n=40)	22.7 ± 5.4	24.8 ± 3.3	15.8 ± 1.9	16.5 ± 1.9	8.0 ± 0.9	8.5 ± 0.7	24.2 ± 5.2	25.5 ± 4.1
Age (years)								
8-12 (n=24)	24.6 ± 5.8	26.1 ± 3.3	16.5 ± 2.5	17.0 ± 2.6	8.0 ± 1.1	8.5 ± 0.5	26.6 ± 4.9	27.5 ± 3.5
12-15 (n=12)	22.5 ± 4.8	22.6 ± 4.4	17.5 ± 2.5	17.7 ± 1.7	7.5 ± 1.5	7.6 ± 1.0	24.7 ± 3.3	25.1 ± 4.1
15.1 or above (n=40)	22.4 ± 5.0	25.4 ± 3.4	16.3 ± 2.4	16.1 ± 2.0	8.1 ± 0.8	8.5 ± 0.7	23.2 ± 4.4	25.3 ± 4.8

## DISCUSSION

Childhood and adolescence are a critical period of human growth and development, any chronic disease can affect it adversely from psychological, social and physical point of view. Although there is tremendous progress in field of medical sciences in the last few decades but still the area of QoL is lacking behind. Studies have shown controversial results regarding QoL in children with CHD. Some states that HRQoL in children with CHD (aged 5-7 year) was comparable to controls. (16) Sufferer of coarctation of the aorta and isolated aortic valve disease reported the best physical health, mental health, and QoL, while patients with cyanotic heart disease or Eisenmenger syndrome had worst outcomes.<sup>17</sup> Similarly, controversy exist regarding the role of surgery in QoL in such patients. Some reported that post-surgical patients have worse HRQOL compared with age -matched healthy controls<sup>18,19</sup> particularly after complex surgery like fontan repair<sup>20</sup> while other concluded that the self-perception of QoL in post-operative patients for CHD is similar and in certain dimensions higher than the healthy population.<sup>21</sup>

These inconclusive results may be due to impact of parental status, social support and coping strategies on QoL in these patients.<sup>22</sup>

This study highlighted self-reported HRQOL data in pre and post operative period in patients with CHD Surgery and it is unique in a sense that data of same patients is compared in pre and post-surgical period showing the impact of surgery on QoL in these two periods .in this study we found that QoL was significantly improved after surgery showing similarity with study on QoL in grown up congenital heart (GUCHO patients). According to this study QoL was comparable to normal population in post-op patient having surgical procedures of isolated TOF, VSD and TGA<sup>23</sup> Assessment of the QoL according to the physical health, mental health, and social interaction should be an important part of the patients' treatment because it enables health professionals to identify the children's individual differences interests and preferences.

## CONCLUSION

There was significant improvement in physical health, psychological wellbeing, social interaction and environmental health in the post intervention period. Overall QoL in the postoperative period was also improved. Timely surgical intervention significantly improves quality of life in patients with structural heart diseases.

*Ethical Approval: Submitted*

*Conflict of Interest: Authors declare no conflict of interest.*

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## AUTHOR'S CONTRIBUTIONS

**KS:** Concept, study design, data collection, data analysis, literature review

**AMS:** Critical review, corrections made

**AK:** data collection, data analysis

**TA:** Provision of sample for study

**HS:** literature review