



# Characteristic Quality of Life Children with Rheumatic Heart Disease

Lilis Nurhayati Sinta Marito Marpaung\*, Tina Christina Lumban Tobing, Rina Amalia Caromina Saragih<sup>1b</sup>

Department of Child Health, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

## Abstract

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**\*Correspondence:** Lilis Nurhayati Sinta Marito Marpaung, Department of Child Health, Faculty of Medicine, Universitas Sumatera Utara, Indonesia. E-mail: [sintadarma16@gmail.com](mailto:sintadarma16@gmail.com)  
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**BACKGROUND:** Rheumatic heart disease is an acquired disease that has characterized damaged valve and it affects the quality of life (QoL) in children.

**AIM:** The aim of the study was to assess QoL in patient with rheumatic heart disease by using pediatric QoL inventory instrument at pediatric cardiologist.

**METHODS:** A descriptive study with cross-sectional study conduct among children aged 5–18 years old attend the Pediatric Cardiology at Haji Adam Malik Hospital Medan from 2016 to 2018.

**RESULTS:** A hundred children with rheumatic heart disease in this study who had affected QoL-based on group age with 5–7 year old in physical function was 6 subjects (85.7%), social function was 1 subject (14.2%), and school function was 2 subjects (28.5%); group age with 8–12 year old in physical function was 100 subjects (100%), emotional function was 3 subjects (3%), social function was 1 subject (3%), and school function was 5 subjects (15.1%); group aged 13–18 years old in physical function was 60 subjects (100%), emotional function was 1 subject (16.7%), and school function was 51 subjects (85%).

**CONCLUSION:** From 100 children with RHD dominant in the group aged 13–18 years old and male, malnutrition status, using of erythromycin, high senior school of level parents' education, and valve disorder was mitral regurgitation. The QoL was affected in all age groups, especially in the domain of physical function and school functions with RHD.

## Introduction

Acute rheumatic fever, an inflammatory disease of the heart, develops after throat infection by Group A beta-hemolytic streptococci [1]. Rheumatic heart disease is acquired heart disease as a result of the sequel of rheumatic fever characterized by a defect in the heart valves [2]. The World Health Organization reported that 18.1 million people are living with infections caused by group A Streptococcus which is serious and causes 347,000 deaths annually with RHD [3]. The prevalence of RHD in Indonesia reported from 0.3 to 0.8 per 1000 school-aged 5–15 years old [4]. The incidence of RHD in 2017 was 72 children at Haji Adam Malik Hospital [5].

The prognosis of patients with RHD is very poor. The beginning of this chronic state usually results in devastating symptoms and physical presentations, all taking part in poor quality of life (QoL) in these patients [6]. Many factors cause increased RHD such as age, socioeconomic, nutritional status, environmental, and low awareness of disease [7]. The success of therapy is not only measured by the survival rate but also by the QoL [8]. Many factors can affect QoL in children such as medication, pain, shortness of breath, discomfort,

environment, and school tasks. Declining QoL includes physical, emotional, social, and school functions. Instrument of pediatric quality of life inventory (PedsQL) can be used to assess the QoL of children with RHD.

## Methods

### Study design

This was a cross-sectional study by consecutive sampling. Data were obtained from medical records from 2016 to 2018 of children who diagnosed with rheumatic heart disease aged 5–18 years old at Pediatric Cardiology at Haji Adam Malik Hospital, Medan. The exclusion criteria were children with congenital heart disease and chronic diseases. The study was approved by Research and Ethics Committee of Medical Faculty, Universitas Sumatera Utara.

### Instrument

PedsQL™ 4.0 generic questionnaire consist of 4 functioning are physical (8 items), emotional (5

items), social (5 items), and school (5 items). The questionnaire was translated into the Indonesia language. This was administered to children in the 5–7, 8–12, and 13–18 years. The instructions ask how much of a problem each item that responses are measured on a five-point rating scale which is 0 (never a problem), 1 (almost never a problem), 2 (sometimes a problem), 3 (often a problem), and 4 (almost always a problem). Each scale transformed to a score ranging from 0-100 which higher scores indicate better QoL.

### Statistical analysis

Statistical analysis was performed using Statistical Package for the Social Science version 20.0. Descriptive data are used to describe the characteristics of the sample. Descriptive data are used to describe the characteristics of the sample by using univariate analysis.

## Results

The general characteristics of subjects are presented in Table 1. A hundred children with rheumatic heart disease were included in this study who were 5 and 18 years old. The genders of this study are 53 male (53%) and 47 (47%) female. Children with a group aged 5–7 years old were 7 subjects (7%), group aged 8–12 years old were 33 subjects (33%), and group aged 13–18 years old were 60 subjects (60%). The nutritional status of children with well-nourished was 29 subjects (29%), mild malnutrition was 46 subjects (46%), and severe nutrition was 25 subjects (25%). The using of antibiotic with erythromycin was 81 subjects (81%), and penicillin was 19 subjects (19%). Parents' education level with primary school was 20 subjects (20%), junior high school was 28 subjects (28%), senior high school was 45 subjects (45%), and college was 7 subjects (7%).

**Table 1: Characteristics of study subjects (n = 100)**

Characteristics	n = 100
Gender, n (%)	
Male	53 (53)
Female	47 (47)
Age group, n (%) (years old)	
5 – 7	7 (7)
8 – 12	33 (33)
13 – 18	60 (60)
Nutritional status, n (%)	
Severe malnutrition	25 (25)
Malnutrition	46 (46)
Well nourish	29 (29)
Antibiotic therapy, n (%)	
Erythromycin	81 (81)
Benzathine penicillin	19 (19)
Parental education, n (%)	
Element	20 (20)
Primary height school	28 (28)
Senior high school	45 (45)
College	7 (7)

The valves disorder accorded to echocardiography with mitral regurgitation (MR) was

40 subjects (40%), mitral stenosis was 7 subjects (7%), aortic regurgitation was 25 subjects (25%), tricuspid regurgitation was 18 subjects (18%), and pulmonary regurgitation was 10 subjects (10%) (Table 2).

**Table 2: Characteristics of subjects based on valve abnormalities and valve degrees according to echocardiography results**

Valve disorder	n (%)	Degree of valve abnormality		
		Mild, n (%)	Moderate, n (%)	Severe, n (%)
MR	80 (31.1)	26 (10.1)	8 (3.1)	46 (17.8)
Mitral stenosis	17 (6.6)	5 (1.9)	2 (0.7)	10 (3.8)
Aortic regurgitation	64 (24.9)	15 (5.8)	21 (8.1)	28 (10.8)
Tricuspid regurgitation	55 (21.4)	34 (13.2)	4 (1.5)	17 (6.6)
Pulmonary regurgitation	41 (15.9)	39 (15.1)	1 (0.3)	1 (0.3)
Total	257 (100)	119 (46.1)	36 (13.7)	102 (39.3)

The affected QoL based on group age with 5–7 year old in physical function was 6 subjects (85.7%), social function was 1 subject (14.2%), and school function was 2 subjects (28.5%) (Table 3); group age with 8–12 year old in physical function was 100 subjects (100%), emotional function was 3 subjects (3%), social function was 1 subject (3%), and school function was 5 subjects (15.1%) (Table 4); group aged 13–18 years old in physical function was 60 subjects (100%), emotional function was 1 subject (16.7%), and school function was 51 subjects (85%) (Table 5).

**Table 3: Basic characteristics of research subjects with quality of life**

Characteristics	Quality of life value	
	Disturbed	Undisturbed
Gender n (%)		
Male	48 (48.0)	5 (5.0)
Female	40 (40.0)	7 (7.0)
Ages (years n [%])		
5 – 7	5 (71.4)	2 (28.5)
8 – 12	28 (84.8)	5 (15.1)
13 – 18	55 (91.6)	5 (8.3)
Nutritional status n (%)		
Well nourish	8 (27.5)	21 (72.4)
Malnutrition	33 (71.7)	13 (45.2)
Severe malnutrition	22 (88.0)	3 (12.0)
Antibiotics n (%)		
Erythromycin	62 (76.5)	19 (23.4)
Benzathine penicillin	14 (73.6)	5 (26.3)
Parental education n (%)		
Elementary school	18 (90.0)	2 (10.0)
Primary high school	18 (64.2)	10 (35.7)
Senior high school	39 (86.6)	6 (44.1)
College	3 (42.8)	4 (57.1)

## Discussion

Rheumatic heart disease found persistent valve abnormalities, especially affecting the mitral and aortic valves (25%), rarely affects the tricuspid valve and pulmonary valve [4]. Sequel and progressive valves disorder reduced productivity and QoL [9]. Researchers reported that there was no difference in gender. In this study, male was dominant with 60 children and group aged 8–12 year old. Boyarchuk *et al.* in Bangladesh reported 19 males (59.4%) and 13 females (40.6%) [10].

The incidence of infection Streptococcus occurs at the age of school children [11]. Literatures showed RHD mostly in children with group aged 5–15 years [12], [13], [14], [15].

**Table 4: Quality of life of children of each function with rheumatic heart disease age group 5 – 7 years**

Characteristics	Quality of Life Value	
	Annoyed	Not disturbed
<b>Physical function</b>		
Walk more than 100 meters	7 (100)	0
Run	7 (100)	0
Physical exercise/sports	7 (100)	0
Lifting heavy objects	7 (100)	0
Bath	0	7 (100)
Activities around the house	0	7 (100)
Feeling sick	0	7 (100)
Feel a little exhilarated	0245	7 (100)
<b>Emotional function</b>		
Feeling scared	0	7 (100)
Feeling sad	0	7 (100)
Feeling angry	0	7 (100)
Hard to sleep	0	7 (100)
Worried	0	7 (100)
<b>Social function</b>		
Problems getting along with other children	0	7 (100)
Other kids do not want to be friends	0	7 (100)
Another friend taunts	0	7 (100)
Cannot do activities like friends his age	0	6 (85.8)
It is hard to make friends	0	0
<b>School functions</b>		
Focus in class	1 (14.2)	7 (100)
Forgot some things	0	7 (100)
Doing homework	0	7 (100)
Missing school because she does not feel well	1 (14.2)	6 (85.8)
Missed school because she went to the doctor	7 (100)	0

Rahmawaty *et al.* reported nutrition status with mall malnutrition was 57 children (71.3%) children. Dominant valve disorder in children with MR followed aortic valve regurgitation due to aortic valve sclerosis which causes dilatation and hypertrophy of the left ventricle with cases of mitral valve are 1 or 3 other valves disorder [16]. In this study, dominant valve disorder was MR. Boyarchuk showed dominant valve disorder was MR in children with RHD [10]. According to Hasnul reported showed most valve disorder was MR (30.4%) at Dr. M. Djamil Padang Hospital in 2015 [17]. Windiani *et al.* reported that 22 subjects with MR were 17 subjects [18].

**Table 5: Quality of life for each function of children with rheumatic heart disease, age group 8 – 12 years**

Characteristics	Quality of Life Value	
	Annoyed	Not disturbed
<b>Physical function</b>		
Walk more than 100 m	21 (63.4)	12 (36.3%)
Run	33 (100)	0
Physical exercise/sports	29 (87.9)	4 (12.1)
Lifting heavy objects	29 (87.9)	4 (12.1)
Bath	0	33 (100)
Activities around the house	0	33 (100)
Feeling sick	9 (27.2)	24 (72.7)
Feel a little exhilarated	3 (8.1)	30 (90.9)
<b>Emotional function</b>		
Feeling scared	0	33 (100)
Feeling sad	0	33 (100)
Feeling angry	11 (33.4)	22 (66.6)
Hard to sleep	0	33 (100)
Worried	1 (3.1)	32 (96.9)
<b>Social function</b>		
Problems getting along with other children	13 (39.4)	20 (60.6)
Other kids do not want to be friends	0	33 (100)
Another friend taunts	0	33 (100)
Cannot do activities like friends his age	21 (63.7)	12 (36.3)
It is hard to make friends	0	33 (100)
<b>School functions</b>		
Focus in class	28 (84.9)	5 (15.1)
Forgot some things	21 (63.7)	12 (36.3)
Doing homework	19 (57.6)	14 (42.4)
Missing school because she does not feel well	33 (100)	0
Missed school because she went to the doctor	33 (100)	0

Many factors make recurrent pharyngitis, such as socioeconomic and level of education, especially in developing countries [2], [19]. Under educate of parents and income made them unknown clinical symptoms,

and poor dense housing caused RHD. In this study, the highest level of parents' education with high school was 39 subjects (86.6%). Melani, in 2009, the level of parents' education with primary school and junior school were 14 subjects (25.9%) [20].

**Table 6: Quality of life for each function of children with rheumatic heart disease, age group 13 – 18 years**

Characteristics	Quality value	
	Annoyed	Not disturbed
<b>Physical function</b>		
Walk more than 1 block	54 (90.0)	6 (10.0)
Run	60 (100)	0
Physical exercise/sports	58 (96.7)	2 (3.3)
Lifting heavy objects	56 (93.4)	4 (6.6)
Bath	0	60 (100)
Activities around the house	46 (76.7)	14 (23.3)
Feeling sick	47 (78.3)	13 (21.6)
Feel a little exhilarated	10 (16.7)	50 (83.3)
<b>Emotional function</b>		
Feeling scared	51 (85.0)	9 (15.0)
Feeling sad	16 (26.7)	44 (73.3)
Feeling angry	46 (76.7)	14 (23.3)
Hard to sleep	0	60 (100)
Worried	42 (70.0)	18 (30.0)
<b>Social function</b>		
Problems getting along with other children	0	60 (100)
Other kids do not want to be friends	0	60 (100)
Another friend taunts	0	60 (100)
Cannot do activities like friends his age	48 (80.0)	12 (20.0)
It is hard to make friends	0	60 (100)
<b>School functions</b>		
Focus in class	49 (84.7)	11 (18.3)
Forgot some things	50 (83.4)	10 (16.6)
Doing homework	47 (78.3)	13 (21.6)
Missing school because she does not feel well	59 (98.4)	1 (1.6)
Missed school because she went to the doctor	58 (96.6)	2 (3.3)

Using of antibiotics give many benefits such as easy of the patient to consume compliance with prescribed regimens, price, and side effects [21]. Windiani *et al.* reported erythromycin treatment for 5 subjects [18]. Musoke *et al.* reported that children with penicillin were 82 subjects for 6 months [22]. In this study, children who consumed erythromycin were 81 subjects (81 %) and penicillin was 19 subjects (19%). Rheumatic heart disease has affected QoL in children [23], [24], [25], [26]. Moraes *et al.* in Brazil reported that QoL in children with RHD such as emotional and school function was disrupted [23]. In this study, it showed affected QoL in children with group age with 5–7 year old in physical function (85.7%), social function (14.2%), and school function (28.5%); group age with 8–12 year old in physical function (100%), emotional function (3%), social function (3%), and school function (15.1%); group aged 13–18 year old in physical function (100%), emotional function (16.7%), and school function (85%) (Table 6).

Limitations in this study are not using a specific questionnaire to assess the QoL of children with rheumatic heart disease and also the collection of domain questionnaires based on reports from parents or family via telephone.

## Conclusion

In this study, from 100 children with RHD dominant in-group aged 13–18 years old and male, mal

malnutrition status, using of erythromycin, high senior school of level parents' education, and valve disorder was MR. The QoL was affected in all age groups, especially in the domain of the physical function and school functions with RHD.

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