Quality Of Life Assessment For Preparatory School Students With Rheumatic Fever

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***Abstract: Background:** Rheumatic fever is a serious health problem, in Egypt; it is still affecting young children with 10% of cases having their first attack before 15 years of age.*
***Aim** of the current study was to assess quality of life for preparatory school students with rheumatic fever.*
***Design** A descriptive research design.*
***Setting:** This study was conducted at (15) preparatory schools in El Masara district in Helwan city.*
***Tools:** Three tools were used for data collection; Tool I: Structural interview questionnaire. Tool II: Anthropometric measurement. Tool III: Quality of life.*
***Results** of the present study revealed that the mean age of studied subjects was13.35±1.47years old. Also, 31.48% of studied subjects had arthritis only and 68.52% of them had arthritis and carditis. Additionally, 94.4% of the studied subjects had poor knowledge. As well as, the study showed that 72.2% of the studied subjects had moderate quality of life physical state. Regarding to their psychosocial state, 88.9% of them had high level of quality of life while 59.3% their academic achievement were moderately affected. Finally there was a statistical significant relation between crowding index and total quality of life of the studied subjects with arthritis at p value= (0.014).*
***Conclusion:** The majority of the studied subjects had poor knowledge about Rheumatic Fever which consequently moderately affect on their physical aspect of their quality of life as well as their academic achievement.*
***Recommendations:** Health educational program to students who had rheumatic fever, their families, school health nurse, and teachers about rheumatic fever, periodic follow up and compliance with treatment to improve their quality of life.*
*.**Key words:** Rheumatic fever, preparatory school students, Quality of life*

I. Introduction

Preparatory school students are the greatest investment of any community and the main basis for its development. Preparatory school students constitute a significant and important sector of the population who are constantly growing and developing. This basic dynamic character accounts for their increased vitality and vulnerability and requires specific health promotion in relation to seeking health and using various resources to attain optimum health. [1]

Rheumatic Fever (RF) is a post infectious, immunologic response to untreated or inadequately treated Group A β-Hemolytic Streptococcus (GABHS) pharyngitis occurring in genetically susceptibility students. Up to 30% of sore throats in students and young people are caused by GAS, and 0.3% to 3% of young people with an untreated GAS sore throat will develop RF. Rheumatic heart disease (RHD) is the only chronic sequel to ARF, with lifelong consequences. As such, ARF and RHD are potentially preventable diseases with timely, adequate and appropriate antibiotic treatment of streptococcal pharyngitis. [2]

Globally, RF was responsible for 5.1 million potential disability-adjusted life years. [3] In developing countries, RF and RHD have been estimated to affect nearly 20 million people. Of 470,000 or 500,000 students who acquire acute rheumatic fever (ARF) every year, 300,000 go on to develop RHD and 233,000 deaths due to RF and RHD worldwide annually. RF largely occurred in children and teens aged 5–15 years. [4]

Group A streptococcus (GAS) pharyngeal infection can be easily transmitted and spread rapidly in families and among school students; pointing to the deleterious effects of overcrowded living conditions and school classrooms as an important cause of the spread of GAS pharyngitis. As well as combination of low socio-economic status, overcrowding, poor sanitary conditions, poor nutrition, poor education and the absence of medical services all have been linked to increased prevalence of acute rheumatic fever (ARF). [5]

Recurrent RF episodes cause cumulative heart valve damage. Mitral valve was the most affected. Valve stenosis and valve regurgitation may occur leading to RHD and its serious complications: heart failure, atrial fibrillation, requirement for major cardiac surgery for valvular repair, and anticoagulation, thrombotic and hemorrhagic complications including stroke, endocarditis and premature mortality. [6] There is a lifetime risk of about 50% to 75% of developing RHD among those with untreated ARF, with either mild, moderate, or severe cardiomegaly or congestive heart failure leading to death. [7]

Quality of life (QOL) is an important subjective measure of student's condition. QOL encompasses several domains of subjective experience including physical ability, psychological well-being, social interactions and school or work performance. Assessment of health-related QOL (HRQOL) of healthy students, as well as students with chronic disease has been reported to be a useful tool to characterize the global burden of the disease. Also, it is important as about 2.5 billion or about 32% of the world population is under age 20 (United Nations, 2015). [8]

School health nursing is one of several traditional roles for community health nurses, early school nursing focused on preventing the spread of disease and treating ailments related to compulsory school attendance. This focus had shifted to preventive and promotive activities including case finding, integration of health concepts into school curricula, and maintained of healthful school environment. [9]

School health nurse play a crucial role in assessing student condition, promoting recovery and ensuring adherence to treatment regimen as well as help the students and teachers to plan quiet activities and arrange rest period after student return to school, discuss with them about student's health needs and finds out about the existing medical services. School health nurse helps in preventing recurrence of rheumatic fever by teaching the students about disease process, possible sequela, good nutrition, hygienic practice and continual need for prophylactic antibiotics. [10]

1.1 Significance of the Study
In Egypt, rheumatic fever is still affecting students with 10% of cases having their first attack before 15 years of age. It represents a serious health problem, as it affected 8-9 per 10.000 of student between 6 to 15 years. [11] In Egypt the total number of students in the age from 11-15 years is 4725732 students. [12] Students in Egypt are influenced by general problems, high density in class (70 students/ class), environmental population and educational stress as many are forced to operate two shifts in a day.[1]

1.2 Aim of the study
The aim of the current study was to assess quality of life for preparatory school students with rheumatic fever through:
- Assess the knowledge of preparatory school students about rheumatic fever.
- Assess the effect of rheumatic fever on quality of life for preparatory school students.

1.3 Research Question:
- Are preparatory school students having adequate knowledge about rheumatic fever?
- Is rheumatic fever affect on physical aspect of quality of life for preparatory school students?
- Is rheumatic fever affect on psychosocial aspect of quality of life for preparatory school students?
- Is rheumatic fever affect on preparatory school students' academic achievement?

II.   Subjects and methods

2.1 Research design:
A descriptive research design was used to conduct the present study.

- **Research setting:**
This study was conducted at preparatory schools in El-Masara district in Helwan city (15 schools).These were El-Shaheed Ahmed Hamdy preparatory school, Khadija bent khowayled preparatory school, El-Masara preparatory school for girls, El-Masara preparatory school for boys, 25 January preparatory school, Saad zaghlol preparatory experimental School, Masr El-Hora preparatory school, Omar ebn El-khatab preparatory school, Fatma el-zaharaa preparatory experimental School, El-Sahwa preparatory school, Agial Masr preparatory school, Zahraa Helwan preparatory school for girls, Zahraa Helwan preparatory school for boys, Mahatet El- kahraba preparatory school and El-kholafaa El-Rashdeen preparatory school.

2.3 Subjects:
The subjects of the existing study were 60 preparatory school students who diagnosed with rheumatic fever, registered in school health files, six students who shared in the pilot study were excluded from the total sample, so the actual sample was 54 students recruited through the academic year 2015-2016. Students fulfilled the following inclusion criteria: Age11-15 years, both sexes, diagnosed with rheumatic fever and free from chronic diseases.

2.4 Sampling technique:

A purposive sample consisted of 60 preparatory school students who diagnosed with rheumatic fever and registered in school health files.

2.5 Tools of data collection

Tool I: Structural interview questionnaire was developed by the researcher to collect the necessary data; It consist of three parts; First Part: Socio-demographic characteristics of the studied preparatory school students. Second Part: Medical history of the studied preparatory school students. Third Part: Students' knowledge about rheumatic fever.

Tool II: **Anthropometric measurement** for students included physical and physiological assessment such as vital signs (pulse, temperature, respiration & blood pressure), weight, height, body mass index (BMI). BMI was estimated by dividing weight (kg) by height^2 (m^2). Students were considered; malnourished or underweight if their BMI was less than 18.5, ideal body weight if BMI from 18.5 to 24.9,over weight if BMI from 25 to 29.9 - Obese if BMI more than 30)**.** Normal blood pressure for students who aged from 11-15 years old was ranged from 95 to140 for systolic blood pressure and from 60 to 90 for diastolic blood pressure. [13]

Tool III: Quality of life for students with rheumatic fever adopted from (Varni, 1998) [14]**. It contained three parts:**

1st part: Concerned with student's physical, psychosocial state and academic achievement.

Scoring system:

Quality of life module included 23 questions in 3 groups. Scores of each question ranged from:

never = 0 point, almost never = 1point, sometimes = 2 points, Often = 3 points, and almost always = 4 points. The total scores of quality of life module questions ranged from 0-92. The scores of QOL were categorized into three levels as the following; high quality of life level < 50% (scored from 0-45), moderate level of quality of life 50-75% (scored from 46-69) and low level of quality of life > 75% (scored from 70-92).

2nd part: Concerned with student's arthritis module which include student's problems with pain, daily activities, treatment, worry and communication.

Scoring system:

Arthritis module included 21 questions in 5 groups. Scores of each question ranged from; never = 0 point, almost never = 1point, sometimes = 2 points, Often = 3 points, and almost always = 4 points. The total scores of arthritis module questions ranged from 0-84.The scores of arthritis module were categorized into three levels as the following; Good level of quality of life < 50% (scored from 0-41), Moderate level of quality of life 50-75% (scored from 42-63) and Bad level of quality of life > 75% (scored from 64-84).

3rd part: Concerned with student's carditis module which include student's heart problems, treatment, physical appearance, treatment anxiety, cognitive problems and communication.

Scoring system:

Carditis module included 26 questions in 6 groups. Scores of each question ranged from; never = 0 point, almost never = 1point, sometimes = 2 points, Often = 3 points, and almost always = 4 points. The total scores of carditis module questions ranged from 0-104. The scores of carditis module were categorized into three levels as the following; good level of quality of life < 50% (scored from 0-51), moderate level of quality of life 50-75% (scored from 52-78) and bad level of quality of life > 75% (scored from 79-104)**.**

2.6 Pilot study

A pilot study was conducted on 6 students. They represented about 10% of the total study sample. The aim of the pilot study was to evaluate clarity, simplicity, applicability of data collection tools, as well as, to determine the time allowed to fulfill the developed tools. The number of the pilot study was excluded from the study sample.

2.7 Fieldwork

The investigator started data collection by introducing herself to the students and explained the aim of the study and its importance. They were assured that the information collected would be treated confidentially and would be used only for the purpose of the study (oral consent was taken from the students). Data pertinent to the study variable were collected through structured face to face interview and all the tools filled by the investigator. Interviewing the students was carried out in specialized room (school clinic). It was taking 20-25 minutes to be filled. The data collection phase was taken 6 months through the academic year 2015-2016 from the beginning of October 2015 to the end of May 2016. Students were interviewed 2days/week (Monday &Tuesday). Investigator was interviewed one or two students per day from 10.00 am to1.00 pm, till the needed sample completed. Anthropometric measurements [vital signs (pulse, temperature, respiration & blood pressure), weight, height, and body mass index] were taken for each student by using available equipment in the school such as stethoscope, sphygmomanometer, thermometer and standing scale.

2.8Ethical considerations:

The study proposal was approved by the ethics committee of the scientific research of the faculty of nursing at Helwan University. Permission has been obtained orally from each student to participate in the study. Before data collection, students were informed about the aim of the study and what would be done with the results. They were given an opportunity to refuse participation on the study and they were notified that they could withdraw at any time from the research. Also, they were assured that the information would remain confidential and used for the research purpose only. Ethics, values, culture and beliefs were respected.

2.9Data management:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 16, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (x^2). For comparison between means of two groups of parametric data of independent samples, student t-test was used. For comparison between means of two groups of non-parametric data of independent samples, Z value of Mann-whitney test was used. For comparison between more than two means of parametric data, F value of ANOVA test was calculated. For comparison between more than two means of non-parametric data, Kruskal-Wallis (χ^2) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p<0.05$ for interpretation of results of tests of significance.

III. Results

Regarding sociodemographic characteristics of the studied subjects,

Table 1 displays that the mean age of studied subjects was13.35±1.47years old. 68.5% of them were in age group13-15years old.79.6% of them were females. Regarding level of parent's education, 34% of fathers and 37% of mothers had secondary education. Whereas 52 % of fathers were workers while 88.9 % of mothers were housewives. 57.4% of studied subjects were the first or second child while 3.7% between the fifth and eighth child. 50% of them reported that their family monthly income was not enough.

Concerning past and present medical history of the studied subjects,

Table 2 shows that the majority (79.6%) of studied subjects, their disease was detected by symptoms. 27.8% of them had arthritis as the most symptom appear at onset of the disease while, 68.5% suffered from dyspnea, palpitation, tired from low effort and joint aches.14.8% of them were hospitalized due to rheumatic fever.59.3% of them were irregular in taking long acting penicillin. 94.4% of them didn't take any instructions to prevent complications. 40.7% of them had family history of rheumatic fever.

Regarding knowledge about rheumatic fever,

Table 3 displays that 45.5% of the studied subjects, their main source of information from previously affected person. Regarding to their information about rheumatic fever, 81.5% know the meaning of rheumatic fever, 66.7% didn't know the causes of disease, 55.6% had incomplete information about signs and symptoms, 88.9% didn't have any information about complication, 61.1% had incomplete information about treatment and 72.2% didn't have any information about preventive measures of rheumatic fever. **Fig. 1** clarifies total knowledge of the studied subjects about rheumatic fever**,** it reveals that 94.4% of studied subjects had poor knowledge, 3.7% of them had fair level while only 1.9% had good knowledge about rheumatic fever.

Concerning physical and physiological body measurements of the studied subjects,

Table 4 displays that the physiological measurements of studied subjects within the normal range as mean score of heart rate represent 77.98±7.41 with rang 63-100, systolic blood pressure's mean represent 115.74±10.39 with rang 90-140, mean of diastolic blood pressure represent 74.63±8.40 with range 60-90, temperature represent 37.12±0.21 with range 36.7-37.5 and mean of respiratory rate was 22.02±20.01 with range 17-23, while mean of body mass index represent 23.73±5.75. **Fig. 2** clarifies body mass index classification of the studied subjects, it shows that 53.7% of the studied subjects had ideal body weight, 27.7 were overweight and 9.3% were equally obese and malnourished.

Regarding quality of life of the studied subjects,

Table 5 shows that 72.2% of the studied subjects had moderate quality of life physical state. Regarding to their psychosocial state, 88.9% of them had high level of quality of life while 59.3% their academic achievement were moderately affected**.** Finally 53.7% of them had high total quality of life.

Concerning distribution of the studied subjects according to their clinical condition, **Fig. 3** reveals that 31.48% of studied subjects had arthritis only and 68.52% of them had arthritis and carditis**.**

Regarding distribution of total quality of life among the studied subjects with arthritis, **Fig. 4** clarifies 68.5% of the studied subjects with arthritis had good quality of life while 31.5% had moderate quality of life. And **Fig. 5**

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display the total quality of life among the studied subjects with carditis, 56.8% of the studied subjects had good quality of life, 40.5% had moderate quality of life and 2.7% had bad quality of life.

Regarding relation between total quality of life among the studied subjects with arthritis and their socio-demographic data,

Table 6 clarifies there was a statistical significant relation between crowding index and total quality of life of the studied subjects with arthritis as p= 0.014.

Regarding relation between total quality of life among the studied subjects with carditis and their socio-demographic data,

Table 7 illustrates that there was a statistical significant relation between mothers' 'education and total quality of life of the studied subjects with carditis as p=0.0001.

IV.   Discussion

Rheumatic fever (RF) is an important medical and public health issues, because it consider an important causes of cardiovascular morbidity and mortality especially in developing world. Over 15 million students around the world suffer from rheumatic fever and rheumatic heart disease, which kills hundreds thousands of students a year, and is the most common acquired heart disease in students and young people in developing countries. [15]

Concerning sociodemographic characteristics, in the present study the mean age of the studied subjects was (13.35±1.47) years. These findings go in line with a study done in Egypt by **Abd El Dayem et al.** [16] clarified that the mean students age was (11.5 ± 2.8) years (4-19 years). Also, these findings were supported by the results of a study done in South Africa by **Makrexeni & Pepeta**[17] who mentioned that ninety three percent of students with rheumatic fever were between the age of 5 and 15 years. This may be due to the highest incidence of rheumatic fever in the age 5-15years as the students spend more time in schools which may be overcrowded and badly ventilated, so that, spread of streptococcal infections is high.

As for sex, the present study revealed that the majority of the studied subjects were females. This finding was in the same line with a study conducted in Zimbabwe by **Gapu et al**. [18] who reported that there were more females (64%) than males with rheumatic fever. However, this finding was contradicting with study conducted in India by **Negi et al.** [19] who found that more than half of students with rheumatic fever were males. This might be due to females are more sensitive to streptococcus A infection.

Regarding father's and mother's education, the present study revealed that more than one quarter of parents had secondary educational level. This finding was disagreement with **Dagmawi** [20] who found in study done in Addis Ababa that one third of parents had elementary education. Also, this result was contradicted with a study conducted in Egypt by **Essawy et al.** [21] who reported that two third of parents were illiterate.

Concerning father's and mother's occupation, the present study revealed that less than half of fathers were workers while the majority of mothers were housewives. This result was in agreement with **Mahmoud et al.** [22] who reported in study done in Egypt that nearly tow third of fathers were workers and the majority of mothers were housewives. This might be due to most parents had secondary education and living in slums area.

Regarding birth order, the present study delineated that more than half of the studied subjects were first or second child in their family. This result was supported by **Ahamed** [23] who found in study conducted in Egypt that the majority of school students were first born child. This might be due to lack of their mothers' experience to care of the first child or having more children.

Regarding crowding index, the present study revealed that overcrowding in houses was seen only in few cases. This finding was in the same line with a study done in South India by **Joseph et al.** [24] who reported that overcrowding in houses was seen only in few cases. In contrast, the study done by **Bajjey & Radwan** [25] which conducted in Upper Egypt, found that overcrowding was present in the majority of RF cases. This might confirm the relation of overcrowding in increasing incidence of rheumatic fever.

Concerning family income/month, the present study delineated that the half of the studied subjects reported that their family income wasn't enough. These findings were in accordance with **Ali** [26] who reported in a study conducted in Egypt, that rheumatic fever was more common in low socioeconomic class. Also, this result supported by **Carvalho et al.** [27] who reported in a study conducted in Brazil, that most patients belonged to low income families. However, this finding was contradicting with a study done in Egypt by **Abosree**[28] found that slightly less than two thirds of studied subjects had enough family income per month. This might be due to the nature of father's occupation that not earns enough money based on their educational level.

The current study revealed that rheumatic fever was detected by symptoms in the majority of studied subjects. These findings were in agreement with a study done in Egypt by **Kotit** [29] who reported that 72.6% of studied subjects were diagnosed with RF by symptoms. This might be due to lack of follow up or seeking medical care as a result of low income and educational level.

The current study revealed that more than one quarter of the studied subjects had arthritis as the most symptoms that appeared at onset of the disease. This finding was supported by **Lawrence et al.** [30] who found in a study conducted in Australia, that 63.5% of the studied subjects had polyarthritis. In the contrast, this

finding was contradicting with a study done in India by **Kumar**[31] found that only 10% of subjects had arthritis. From researcher's and literature point of view, this might be due to arthritis occurs in about 75% of students with rheumatic and it is the earliest symptomatic manifestation of rheumatic fever.

The current study revealed that less than one quarter of the studied subjects were hospitalized due to rheumatic fever. This result was on the same line with **Gezahegn**[32] who reported in a study conducted in Addis Ababa that 29% of the students had admission to the hospital due to rheumatic fever. Also, this result was in agreement with **Boyarchuk et al.** [33] who found in a study done in Ukraine that the majority of the ARF patients were admitted to the hospital.

The present study revealed that more than half of the studied subjects were irregular in taking long acting penicillin. In the same context, study conducted at Tanta University in Egypt by **Elsayed and Elawany**[34] reported that irregular adherence to prophylactic treatment was found in more than half of studied children. On the other hand, this finding was disagreement with a study conducted in India by **Tullu et al.** [35] found that the rate of adherence with prophylaxis was 90% among the studied subjects. This might This might be due to inadequate counseling and might indicate that lack of students' knowledge about RF complication led to decrease compliance with treatment regimen.

The current study revealed that the majority of the studied subjects didn't take any instructions from physician to prevent complication. This finding was disagreed with a study done in South Africa by **Robertson et al.** [36] who reported that patients were educated about rheumatic fever and its complications. As well, this result was contradicting with a study conducted in Jamaica by **Thompson et al.** [37] who found that most clients strongly agreed that nurses and doctors encouraged them to take their prophylaxis.

The present study revealed that less than half of the studied subjects had family history of rheumatic fever. This finding was supported by **Özer et al.** [38] who reported in a study conducted in Ankara, Turkey, that there was positive family history of rheumatic fever in 10.8% of studied children. On the other hand, this finding disagreement with **Mahmoud et al.** [22] who reported in study done in Tanta city, Egypt, that nearly two thirds of the studied children having no family history regarding to RF. This might confirm that genetic predisposition as one of the predisposing factors of rheumatic fever.

Regarding to the total knowledge of the studied subjects about rheumatic fever, the current study revealed that the most of studied subjects had poor knowledge about rheumatic fever. This finding was in agreement with study conducted at Tanta University in Egypt by **Elsayed and Elawany** [34] who reported that most of children were poor in their knowledge, 23 % were good and 17% were fair. This might be due to shortage of clear simple data sources about the disease and the shortage of health education provided to them from the health care providers about the disease.

Regarding to body mass index, the present study revealed that more than half of studied subjects had ideal body weight, while less than one third of them were overweight and minority were equally obese and malnourished. This result was contradicted with **Mahmoud et al.** [22] who reported in study conducted in Egypt that 62% of children were underweight, 23% had normal body weight and 12% were overweight. As well, this result was disagreed with **Roshdy et al.** [39] who reported in a published study done in Upper Egypt that a high percentage of cases were underweight in Assiut and Sohag (52.5% and 67.5% respectively), while (42.5%) of the children in Assiut had normal weight and (28.75%) in Sohag had normal weight.

Regarding the total quality of life, the current study revealed that less than three quarter of studied subjects had moderate physical state also; the majority of them had high psychosocial state, while more than half of them had moderate academic achievement and had high quality of life. These findings were disagreed with **Assad** [40] who reported in a study conducted in Egypt that the majority of children with RF had average quality of life. As well, these findings were on the same line with a study conducted in Egypt by **Mahmoud et al** [22] who reported that the majority of them had good academic performance. Also, these findings were similar to a study done in Brazil by **Carvalho et al.** [27] who reported that the studied subjects had intermediate scores in the physical domain. This may be due to student's bad response to disease management as they irregular in taking medication and their carelessness about severity of the disease and its complication.

Regarding distribution of the studied subjects according to their clinical condition, the current study revealed that less than one third of studied subjects had arthritis only while, more than two third of them had arthritis and carditis. This result was in line with **Carvalho et al.** [41] who reported in a published study conducted in Brazil that the association of carditis and arthritis occurred in 40% of the studied subjects. From researcher's and literature point of view, this might be due to arthritis occurs in about 75% of students with rheumatic and carditis affects about 30% of students who develop rheumatic fever.

The present study showed that the studied subjects who had arthritis, more than two third of them had good quality of life and nearly one third had moderate quality of life, while the studied subjects who had arthritis and carditis, more than half of them had good quality of life and more than one third had moderate quality of life. These findings were disagreed with **Essawy et al.** [21] who reported in a study conducted in Egypt, that children who had arthritis (73.9%) had a neutral QOL and 17.4% of them had high QOL, while

children who had arthritis and carditis, more than two thirds of them (66.2%) had a neutral QOL and about one third had high QOL.

Regarding the relation between total QOL among the studied subjects with arthritis and their sociodemographic data, the present study revealed that there was a statistical significant relation between total QOL of studied subjects with arthritis and crowding index. These findings were supported by **Solari & Mare** [42] who found in a study conducted in U.S.A., that several dimensions of children's wellbeing suffer when exposed to crowded living conditions. Also, this result was in line with **Jaine et al.** [43] who reported ARF rates were significantly and positively related to household crowding. This might confirming that overcrowding increase spread of streptococcal infection thus, subsequently increase incidence and prevalence of RF and its complication.

Regarding the relation between total quality of life of the studied subjects with carditis and their sociodemographic data, the present study revealed that there was a statistical significant relation between total quality of life of the studied subjects with carditis and mothers' education. This result was in accordance with **Toa,** [44] in South Africa as he mentioned that positive relations were found between mothers' level of education and total QOL of the studied children. This might confirming that high educational level of mothers will affect their awareness about the disease so, they can provide better care for their children and improve their children's quality of life.

V.   Conclusion

Based on the present study findings, it was concluded that the mean age of the studied subjects was13.35±1.47years and the majority of the studied subjects were females. Also, less than one third of studied subjects had arthritis only while, more than two third of them had arthritis and carditis. The majority of the studied subjects had poor knowledge about rheumatic fever which consequently affect on their quality of life as less than three quarter of studied subjects had moderate physical state also; the majority of them had high psychosocial state, while more than half of them had moderate academic achievement and had high quality of life. There was a statistical significant relation between crowding index and total quality of life among the studied subjects with arthritis.

VI.   Recommendations

On the basis of the current study findings, the following recommendations are suggested:

Health educational program should be given for school students who had rheumatic fever and their families about periodic follow up and compliance with treatment to improve their quality of life, educational program for school health team and teachers about the effect of RF on students' physical, psychosocial state and academic achievement, follow up for students with rheumatic fever by health care team in schools to determine their commitment with treatment regimen and to prevent complication, preparing school nurses with high level of efficiency, knowledge and practices to provide better care for students suffering from rheumatic fever through carrying out education programs and Further studies are needed for more investigations about the effect of Rheumatic fever on students' academic achievement.

Table (1): Frequency Distribution of The Studied Subjects Regarding Socio-Demographic Characteristics (n=54).

Variables	N	%
Age years:		
11-<13	17	31.5
13-15	37	68.5
Range	11-15	
Mean±SD	13.35±1.47	
Sex:		
Males	11	20.4
Females	43	79.6
#Fathers' education level:(n=50)		
Illiterate	11	22.0
Read & write	5	10.0
Preparatory education	6	12.0
Secondary education	17	34.0
University education	11	22.0
Fathers' occupation:(n=50)		
Governmental employee	11	22.0
Workers	26	52.0
Not working (Retired)	2	4.0
Professional employee	11	22.0
Mothers' education level:		
Illiterate	18	33.3
Read & write	2	3.7
Preparatory education	5	9.3

Secondary education	20	37.0
University education	9	16.7
Mothers' occupation:		
House wife	48	88.9
Employee	4	7.4
Worker	2	3.7
Birth order:		
1-2	31	57.4
3-4	21	38.9
5-<8	2	3.7
Crowding index:		
1-2	31	57.4
3-4	20	37.0
5-6	3	5.6
Income/ month:		
Not enough	27	50.0
Enough	16	29.6
Enough & saved	11	20.4

Table (2): Frequency Distribution of the Studied Subjects Regarding Past and Present Medical History (n=54)

Variables	N	%
Duration of disease (years):		
Mean±SD	3.53±2.08	
The disease is detected:		
From symptoms	43	79.6
By chance (Accidental)	11	20.4
Symptoms appear at onset of the disease:		
Throat infection	6	11.1
Fever	13	24.1
Arthritis	15	27.8
General body aches	10	18.5
Arthralgia	2	3.7
All the above	8	14.8
Action taken on detection of disease:		
Admission at hospital	8	14.8
Treatment at home under medical observation	36	66.7
Treatment at home with no medical observation	10	18.5
Admitted to hospital due to rheumatic fever:		
Yes	8	14.8
No	46	85.5
Students suffer from the following symptoms:		
Dyspnea	2	3.7
Palpitation	3	5.6
Tiredness from least effort	3	5.6
Joint aches	9	16.7
All the above	37	68.5
Student periodic follow up of disease:		
Yes	29	53.7
Sometimes	20	37.0
No	5	9.3
Place of periodic follow up:(total=49)		
Specialist	11	22.4
Governmental hospital	38	77.6
Taking long acting penicillin:		
Yes	54	100
No	0	0.0
-Compliance with treatment:		
Yes	17	31.5
Sometimes	32	59.3
No	5	9.3
Take instructions from physician to prevent complications:		
Yes	3	5.6
No	51	94.4
Family members are affected with rheumatic fever:		
Yes	22	40.7
No	32	59.3

Table (3) :Frequency Distribution of The Studied Subjects' Knowledge about Rheumatic Fever (n=54)

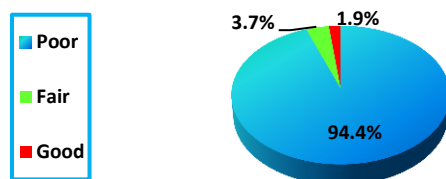| Knowledge items about rheumatic fever	N	%
Meaning of rheumatic fever:		
Yes	44	81.5
No	10	18.5
- The sources of information:(n=44)		
Friends & neighbors	6	13.6
Members in health field	18	40.9
Previously affected person	20	45.5
Causes of rheumatic fever :		
Correct	3	5.6
Incorrect	15	27.8
Don't know	36	66.7
Risk factors leading to the disease:		
Complete	1	1.9
Incomplete	16	29.6
Don't know	37	68.5
Signs and symptoms of the disease:		
Complete	1	1.9
Incomplete	30	55.6
Don't know	23	42.6
Complications of the disease:		
Complete	2	3.7
Incomplete	4	7.4
Don't know	48	88.9
Cardiac symptoms due to effect of rheumatic fever :		
Complete	3	5.6
Incomplete	10	18.5
Don't know	41	75.9
Treatment of rheumatic fever :		
Incomplete	33	61.1
Don't know	21	38.9
Preventive measures of rheumatic fever :		
Complete	1	1.9
Incomplete	14	25.9
Don't know	39	72.2
Scores of total knowledge:	0-13	
Range (0-15)	3.48±2.70	
Mean±SD		

Figure (1):Total Knowledge Levels of The Studied Subjects about Rheumatic Fever(n=54)

Table (4) :Mean scores of Physical and Physiological Body Measurements of The Studied Subjects (n=54)

| Physical and physiological body measurements	Mean values of measurements among the studied preparatory school students with rheumatic fever (n=54)	
	Range	**Mean±SD**
Heart rate	63-100	77.98±7.41
Systolic blood pressure	90-140	115.74±10.39
Diastolic blood pressure	60-90	74.63±8.40
Temperature	36.70-37.50	37.12±0.21
Respiratory rate	17-23	22.02±20.01
Height (cm)	100-176	147.26±20.24
Weight (kg)	21-83	53.21±13.64
Body mass index	16-42	23.73±5.75
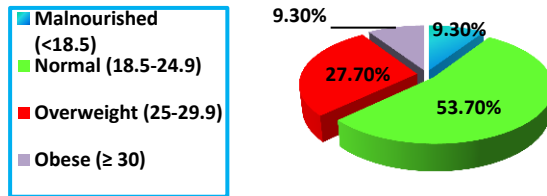
Figure (2): Body Mass Index Classification of The Studied Subjects (n=54).

Table (5): Frequency Distribution of Total Quality of Life among The Studied Subjects(n=54).

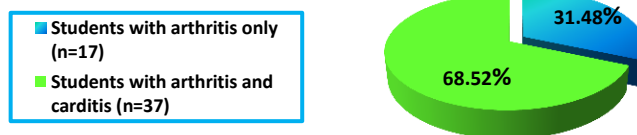| Quality of life	Levels of quality of life among the studied preparatory school students with rheumatic fever (n=54)					
	High level		Moderate level		Low level	
	N	%	N	%	N	%
A-Physical state	6	11.1	39	72.2	9	16.7
B-Psychosocial state	48	88.9	4	7.4	2	3.7
C-Academic achievement	15	27.8	32	59.3	7	13.0
Total quality of life levels	29	53.7	23	42.6	2	3.7

Figure (3): Distribution of The Studied Subjects According to Their Clinical Condition (n=54).
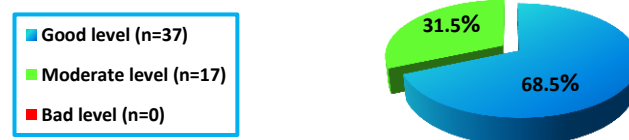

Figure (4): Distribution of Total Quality of Life among The Studied Subjects with Arthritis (n=54) .
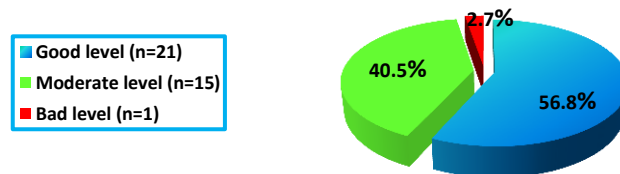

Figure (5): Distribution of Total Quality of Life among The Studied Subjects with Carditis (n=37).

Table (6): Relation between Total Quality of Life among The Studied Subjects with Arthritis and their Socio-demographic data (n=54).

Variables	Levels of total QOL among the studied subjects with arthritis (n=54)				χ^2	P
	Good level (n=37)		Moderate level(n=17)			
	N	%	N	%		
Age years:						
11-<13	13	76.5	4	23.5	0.727	0.394
13-15	24	65.9	13	35.1		
Sex:						
Males	9	81.8	2	18.2	1.133	0.287
Females	28	65.1	15	34.9		
#Fathers' occupation (n=50):	(n=35)		(n=15)			
Governmental employee	8	72.7	3	27.3	2.514	0.473
Workers	16	61.5	10	38.5		

					χ²	P
Not working (Retired)	2	100	0	0		
Professional employee	9	81.8	2	18.2		
Mothers' occupation:						
House wife	31	64.6	17	35.4	3.101	0.212
Employee	4	100	0	0		
Worker	2	100	0	0		
Birth order:						
1&2	24	77.4	7	22.6	4.593	0.101
3&4	11	52.4	10	47.6		
5-<8	2	100	0	0		
Crowding index:						
1-2	26	83.9	5	16.1		
3-4	9	45.0	11	55.0	8.521	0.014*
5-6	2	66.7	1	33.3		
Body mass index (BMI):						
Malnourished	5	100	0	0		
Normal	19	65.5	10	34.5	3.229	0.358
Overweight	9	60.0	6	40.0		
Obese	4	80.0	1	20.0		
Income/ month:						
Not enough	16	50.3	11	40.7	2.366	0.306
Enough	13	81.3	3	18.8		
Enough & saved	8	72.7	3	27.3		

#4 out of fathers were dead
*Significant (P<0.05)

Table (7): Relation between Total Quality of Life among The Studied Subjects with Carditis and their Socio-demographic data (n=37).

Variables	Levels of total QOL among the studied subjects with carditis (n=37)						χ²	P
	Good level (n=21)		**Moderate level (n=15)**		**Bad level (n=1)**			
	N	%	N	%	N	%		
Age years:								
11-<13	5	55.6	4	44.4	0	0	0.369	0.831
13-15	16	57.1	11	39.3	1	3.6		
Sex:								
Males	4	57.1	3	42.9	0	0	0.245	0.885
Females	17	56.7	12	40.0	1	3.3		
#Fathers' education level(n=33):	**(n=19)**		**(n=13)**					
Illiterate	4	50.0	4	50.0	0	0		
Read & write	1	33.3	1	33.3	1	33.3		
Preparatory educ.	3	75.0	1	25.0	0	0	2.640	0.620
Secondary educ.	5	50.0	5	50.0	0	0		
University educ.	6	75.0	2	25.0	0	0		
#Fathers' occupation (n=33):	**(n=19)**		**(n=13)**					
Governmental employee	3	50.0	3	50.0	0	0		
Unskilled & skilled workers	8	50.0	7	43.8	1	6.2	5.932	0.821
Not working (Retired)	1	50.0	1	50.0	0	0		
Professional employee	7	77.8	2	22.2	0	0		
Mothers' education level:								
Illiterate	6	46.2	7	53.8	0	0		
Read & write	0	0	0	0	1	100	40.078	0.0001*
Primary &Preparatory educ.	3	100	0	0	0	0		
Secondary educ.	8	61.5	5	38.5	0	0		
University educ.	4	57.1	3	42.9	0	0		
Mothers' occupation:								
House wife	18	54.6	14	42.4	1	3.0	1.004	0.909
Employee	2	66.7	1	33.3	0	0		
Worker	1	100	0	0	0	0		
Birth order:								
1-2	15	68.2	6	27.3	1	4.5	5.848	0.211
3-4	6	46.2	7	53.8	0	0		
5- < 8	0	0	2	100	0	0		
Crowding index:								
1-2	16	69.6	7	30.4	0	0		
3-4	4	36.4	6	54.5	1	9.1	5.741	0.219
5-6	1	33.3	2	66.7	0	0		
Body mass index (BMI):								
Malnourished	0	0	4	100	0	0	8.575	0.199
Normal	14	70.0	5	25.0	1	5.0		

Overweight	5	55.6	4	44.4	0	0	
Obese	2	50.0	2	50.0	0	0	
Income/ month:							
Not enough	10	50.0	9	45.0	1	5.0	
Enough	6	60.0	4	40.0	0	0	1.641	0.801
Enough & spare	5	71.4	2	28.6	0	0	

 #   4 out of fathers were dead
*Significant (P<0.05)

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