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RESEARCH ARTICLE

Effect of rheumatic fever on the life style of children in the basic education stage in Tanta city, Egypt.

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Abstract

The aim of this study was to identify the effect of rheumatic fever on the life style of primary school children aged (6-12) years in Tanta City. **Study design:** Descriptive cross sectional. **Setting:** the study was conducted in the out patient medical clinics of three health units affiliated to the students' health insurance serving Tanta city. **Sample:** 100 students attending the previous setting. **(I):-** An interview sheet included socio demographic, environmental data and information about the history of Rheumatic fever disease diagnosis. **(II):-** Life style assessment sheet. **(III):-** Body mass index of the child. **Results:** - Rheumatic fever affects dietary habits of the majority (82.9% and 87.8% respectively) of children less than 10 years. There is a statistically significant difference between the children aged <10 years, 10-12 years old and the children's preference of certain types of food. There was a statistically significant difference between frequency of follow up visits of the children and their age. More than half (58.6%) of children that their duration of illness <15 months had a school absenteeism < 3 days/month, furthermore the majority of them (87.9%) had good academic performance. **Conclusion and recommendations:** Rheumatic fever had an impact on the most of the life style of the children. It affected the dietary habits of the majority of the children with illiterate parents. Psychological state of most of the studied children was affected. Nearly two thirds of the studied children didn't participate in school activities, more than half of them didn't participate due to their frequent absenteeism from school. This is a need for designing and carrying out education programs for children with rheumatic fever and their families about compliance with treatment to avoid complication of disease and improve their lifestyle. Preparing nurses with high level of efficiency, knowledge and practices to provide better care for children suffering from rheumatic fever through carrying out education programs.

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INTRODUCTION

Rheumatic fever (RF) is a major public health problem and it is an important cause of acquired cardiovascular disease in childhood and adolescence⁽¹⁾, Producing an economic burden on the healthcare system in low and developing countries because of the costs of medical treatment and heart valve surgery and also it is a disease of young adults, who are the most economically active group of any population⁽²⁾. Rheumatic fever is still one of the major public health problems in Egypt, the developing countries, and lower socio economic areas, and it is a major cause of death and disability in children and adolescents⁽³⁾.

Rheumatic fever is the most common cause of acquired heart disease worldwide. Rheumatic heart disease (RHD) is the most significant sequel of rheumatic fever (RF) ^(3, 4). Although the exact causal pathway is unknown it seems that some strains of group A streptococcus (GAS) are “rheumatogenic” and that a small proportion of people in any population (3-5%) have an inherent susceptibility to acute rheumatic fever (ARF). Acute rheumatic fever (ARF) is an autoimmune consequence of infection with group A streptococci (GAS) ⁽⁴⁾.

Rheumatic fever (acute rheumatic fever or ARF) is a systemic inflammatory disease of the childhood that may develop two or three weeks after group A B-hemolytic streptococcal pharyngitis (GABHS) infection. It is believed to be caused by antibody cross-reactivity and can involve the heart, joints, skin, and brain. Acute rheumatic fever commonly appears in children between the ages of 5 and 15 years ⁽⁴⁾.

According to the World Health Organization (WHO), in 2012, RF/RHD affects about 15.6 million people worldwide, with 282,000 new cases and 233,000 deaths each year. In 2008, it was estimated that over 2.4 million children aged 5-14 years are affected with RHD and 79% of all RHD cases come from less developed countries whereas in 2009, there was about 8 million children are affected with rheumatic fever and rheumatic heart disease ⁽⁶⁻⁸⁾.

Worldwide, Rheumatic fever remains a major health problem occurring in approximately 100 in 100,000 children under 18 years, especially in under developed countries where access to medical care is limited and children live in poverty and unsanitary crowded conditions, in developing countries, rheumatic fever is the predominant cause of acquired childhood cardiopathy ⁽⁹⁾.

In Egypt, rheumatic fever is still affecting young children 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 children between 6 to 12 years ^(10, 11). Statistics in Tanta city there is 185 case of rheumatic fever among primary and secondary school students ⁽¹²⁾.

The onset of the disease is usually sudden, about one to eight weeks after recovery from scarlet fever or a sore throat. The disease onset most often is characterized by an acute febrile illness, accompanied by a large -joint migratory arthritis, possibly with concomitant signs of carditis, valvular inflammation or with central nervous system (CNS) involvement and chorea. Although acute episodes typically are self limited, they may lead to chronic and progressive heart disease and cardiac decompensation ⁽¹³⁾.

Life style of children with rheumatic fever is affected by numerous factors including medical factors which are presented by perceived difficulties in adherence to rheumatic regimen, complications, duration and onset of disease. On the other hand, the social factors are presented by age; gender and nursing intervention also influence life style ^(14, 15).

Nursing care of the child with rheumatic fever is complex, rewarding and challenging. The successful recovery and rehabilitation of the child is made possible with careful nursing assessment, diagnosis, intervention and evaluation of all body systems through follow up care of the child ⁽¹²⁾.

The main role of community health nurse especially the school health nurse is to do comprehensive assessment of health problems and health needs of the child and establish the goal to facilitate the nursing intervention, and to provide preventive, curative and rehabilitative care to the child. This will enhance the health promotion of the children; decrease the complications, disabilities and period of hospitalization ⁽¹⁶⁾. The aim of this study was to identify the effect of rheumatic fever on the life style of primary school children aged (6-12) years in Tanta City.

Research question:

What are the effects of rheumatic fever on the life style of primary school children aged (6-12) years in Tanta City?

Materials and Method

Materials

Study design:-

Descriptive cross sectional study design.

Setting:-

This study was conducted in the rheumatic heart disease out patient medical clinics of three health units affiliated to the students' health insurance serving Tanta city:

1-School health unit in the first district of Tanta city in Saied Street

2- School health unit in the second district of Tanta city in Taha El-Hakim Street in Tanta city in El- Gharbia governorate.

3- School health unit in the third district of Tanta city in Segar area in Tanta city in El- Gharbia governorate.

Subjects:-

A convenient number of 100 primary school students (all rheumatic fever students in Tanta city aged 6-12 years old) attending the previous settings were included in the study. Aged from 6-12 years diagnosed with rheumatic fever and having no other chronic disease taking their service from the previous setting was included in the study.

The following criteria were used for selecting the sample:-**Inclusive criteria:-**

- Age from 6-12 years.
- Both sexes
- The student is enrolled in governmental school in Tanta city.

Exclusive criteria:-

- Have other chronic disease.

Tools of data collection:-

Three tools were developed by the researcher in order to obtain the necessary data for the study:-

Tool (I): an interview sheet about rheumatic fever school student, it was included two parts:-**Part I:-**

A-Socio demographic data of child: this included child's age, sex, birth order, level of education, parent's age, education, occupation, and family income. Type of housing, residence, house room number, bathrooms at house and source of drinking water.

Part II:-

Knowledge about the history of Rheumatic fever disease diagnosis as: onset of rheumatic fever, present complaints, date of starting treatment, the number of visits seeking treatment per month & Type of medication (may affect on general condition).

Tool (II): Life style assessment sheet, this tool was included six items.

1-Health maintenance skills and physical functioning activities of daily living such as: (diet habits, sleeping pattern, hygiene, exercise & hobbies).

2-Psychological and spiritual attitudes, such as: satisfaction of life and spiritual aspects such as praying, going to mosque, church.

3-Social involvement, this was included: peer relationship scholastic activities, school achievement and participation in recreational activities.

4-Family relationships such as: relationship with his or her parents & his or her sibling, participation in family activities.

5-Psychological state of the child such as: Such as the impact of rheumatic fever on the child life, does the child hide the nature of illness from others and does the child receive the same treatment from his parents like the rest of the family?

6-Self actualization style such as: child satisfaction about himself, if his illness prevents him from achieving his aims.

Tool (III) Body mass index measurement of the child:

A platform scale was used. The student was asked to remove bulky clothes and shoes. Place the scale on the zero value before the student steps on the scale. The student was asked to stand with both feet on the center of the platform scale, and read the measurements to the nearest 500 gm. Then body mass index (BMI) was calculated as follows:-

Body mass index was plotted on growth charts to determine BMI for sex and age percentile (appendix 2-a) for boys and (appendix 2-b) for girls, then the children's weight were categorized into four groups according to BMI percentiles as follows ⁽¹⁷⁾:

Category	BMI (children 2-20 years)
Normal group children	BMI for age $\geq 5^{\text{th}}$ percentile & $< 85^{\text{th}}$ percentile.
Under weight group children	BMI for age $< 5^{\text{th}}$ percentile
Over weight group children	BMI for age $\geq 85^{\text{th}}$ percentile & $< 95^{\text{th}}$ percentile.
Obese group children	BMI for age $\geq 95^{\text{th}}$ percentile.

Method

1-Official permission to conduct the study was obtained from the faculty of Nursing, Tanta University and the Ministry of Health to conduct the study at School health insurance units (I, II, III) in Tanta city.

2- Study tool was developed by the researcher based on literature review. Then sheet were submitted to five experts in the field of nursing and medicine for testing the face and content validity. Validity of the questionnaires based on experts opinions were calculated and found to be (98.9%).

4-Ethical and legal considerations:-

A-An informed consent for participation in the study was obtained from the entire sample.

B-Nature of the study was not causing any harm and /or pain for the entire sample.

C-Confidentiality and privacy was put into consideration regarding the data collected.

D- Every child was informed about the purpose and benefits of the study at the beginning of the interview.

5-Apilot study was carried out on 20 students to test the tool for its clarity and organization and to determine the length of time needed to collect the data from each child. The necessary modification was done.

6- The structured interview was conducted at Health insurance units (I, II, III) for each child with or without his mother (care giver) at two days working days of the week (Sunday and Thursday). The average time spend for collecting data from each child was 20 to 30 minutes to complete the interview.

7 - Collection of data was done during the period from the middle of February 2012 to the last of Mai 2012, and from the middle of September 2012 to the last of November 2012.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS version 19(statistical package for social studies).Variables were presented as number and percentage. Differences between observation of subcategories were tested using qui square test .When qui square test wasn't valid for testing due to small expected observations more than 25% of total observations ,fissure exact test or Monte Carlo test was used as convenient ,the level of significance was adopted at $p < 0.05$.

Results

Table (1): Socio-demographic characteristics & family social level of the studied children.

Socio-demographic characteristics	The studied children (n=100)	
	Number (n=100)	%
Age in years:		
6	3	3%
7-9	38	38%
10-12	59	59%
Gender:		
Males	36	36%
Females	64	64%
Birth order:		
1	35	35%
2	34	34%
3	28	28%
4-5	3	3%
Educational level of fathers:		
Illiterate	54	54%
Primary	4	4%
Secondary	19	19%

University	23	23%
Fathers' job:		
Employee	30	30%
Professional	7	7%
Manual worker	63	63%
Educational level of mothers:		
Illiterate	63	63%
Primary	8	8%
Secondary	12	12%
University	15	15%
Unidentified	2	2%
Mothers' job:		
Housewife	83	83%
Working	17	17%

Con. Table (1):-

Socio-demographic characteristics	The studied children (n=100)	
	Number (n=100)	%
Educational level of mothers:		
Illiterate	63	63%
Primary	8	8%
Secondary	12	12%
University	15	15%
Unidentified	2	2%
Mothers' job:		
Housewife	83	83%
Working	17	17%
Family income:		
Enough and saving	13	13%
Enough	40	40%
Not enough	47	47%

Table (1):- The result revealed that their age ranged from 6-12 years. About two thirds of them were females (64%). More than one third of them (35% and 34%) respectively were the first or second child. As regards to fathers education more than half (54%) of them were illiterates or read and write, and (23%) of them had university education, and (19%) of them had secondary education. Nearly two thirds of them (63%) were manual workers and (30%) were employee and only (7%) were professionals. The majority of the mothers they were illiterate and housewives (63% & 83% respectively), less than one quarter (20% and 17% respectively) of them had primary or secondary education and were working. The table also shows that (47%) of the total families had insufficient income and only (13%) of them reported that it was enough and saving.

Table (2) Relationship between age in years and dietary habits of studied children

Dietary habits	Age <10 years (n=41)		Age 10-12 years (n=59)		X ²	p
	n	%	n	%		
Rheumatic fever affected dietary habits	34	82.9	42	71.2	1.828	0.176
Number of meals per day:					MCET	1.000
2	26	63.4	36	61.0		
3	13	31.7	19	32.2		
>3	2	4.9	4	6.8		
Preference of certain banned types of food: (n=80; 33 and 47, respectively)						
Fast food	19	57.6	12	25.5	8.388	0.004*
Meat	3	9.1	1	2.1	FE	0.301
Stained deserts and preserved foods	22	66.7	17	36.2	7.217	0.007*
Whole milk	2	6.1	1	2.1	FE	0.566
Spicy foods	9	27.3	11	23.4	0.155	0.694
All of the above	11	33.3	28	59.6	5.343	0.021*
Type of food:					FE	0.756
Integrated meal	5	12.2	6	10.2		
Non integrated meal	36	87.8	53	89.8		

*Significant P< 0.05

Table (2):- presents relationship between age in years and dietary habits of studied children. The result revealed that rheumatic fever affects dietary habits of the majority (82.9% and 87.8% respectively) of children less than 10 years, moreover they also received non integrated meal. Similarly, rheumatic fever affect dietary habits of more than two third (71.2%) of children aged (10-12 years) and the majority of them (89.8%) receive non integrated meal. From this table it can be seen that the difference between age in years and dietary habits of studied children was not statistically significant except for preference of (fast food, stained deserts and preserved food and all banned food) as P value equal 0.004, 0.007 and 0.021 respectively.

Table (3) Relationship between fathers' education, mothers' education and dietary habits of studied children

Dietary habits	Fathers' education						X ²	p
	Illiterate (n=54)		Literate (n=46)					
	n	%	n	%				
Rheumatic fever affected dietary habits	44	81.5	32	69.9			1.934	0.164
Number of meals per day:					MCET		0.080	
2	37	68.5	25	54.3				
3	16	29.6	16	34.8				
>3	1	1.9	5	10.9				
Type of food:					6.383		0.012*	
Integrated meal	2	3.7	9	19.6				
Non integrated meal	52	96.3	37	80.4				
Dietary habits	Mothers' education						X ²	p
	Illiterate (n=63)		Literate (n=37)					
	n	%	n	%				
Rheumatic fever affected dietary habits	52	82.5	24	64.9			3.992	0.046*
Number of meals per day:					MCET		0.070	
2	42	66.7	20	54.1				
3	20	31.7	12	32.4				
>3	1	1.6	5	13.5				
Type of food:					FE		0.320	
Integrated meal	5	7.9	6	16.2				
Non integrated meal	58	92.1	31	83.8				
Non integrated meal	52	96.3	37	80.4				

*Significant P< 0.05

Table (3):- Shows the relationship between fathers' education, mothers' education and dietary habits of studied children. The findings revealed that rheumatic fever affect dietary habits of the majority (81.5%) of children of illiterate fathers. The table shows that the difference between fathers' education and dietary habits of studied children was not statistically significant except for the relation with type of food as P value equal 0.012. The majority of children with illiterate mothers (82.5%, and 92.1% respectively) their dietary habits were affected, and received non integrated meal. This compared with more than two thirds (64.9%) of children with literate mothers their dietary habits were affected, furthermore more than three quarter of them (83.8%) received non integrated meal. It was found that the difference between mothers' education and dietary habits of studied children was not statistically significant except for the relation with dietary habits as P value equal 0.046.

Table (4) Relationship between children's frequency of follow up visits and demographic characteristics

Variables	Follow up visits								X ²	p
	Once/month		Twice/month		Thrice/month		Weekly or more			
	n	%	n	%	n	%	n	%		
Age in years:									8.277	0.041*
<10	4	9.8	7	17.1	12	29.3	18	43.9		
10-12	20	33.9	7	11.9	10	16.9	22	37.3		
Birth order:									MCET	0.380
First	10	28.5	7	20.0	7	20.0	11	31.4		
Second	10	29.4	3	8.8	6	17.5	15	44.1		
Third or more	4	12.9	4	12.9	9	29.0	14	45.2		
Fathers' education:									1.116	0.773
Illiterate	14	25.9	7	13.0	10	18.5	23	42.6		
Literate	10	21.7	7	15.2	12	26.1	17	37.0		
Mothers' education:									2.084	0.555
Illiterate	14	22.2	7	11.1	14	22.2	28	44.4		
Literate	10	27.0	7	18.9	8	21.6	12	32.4		

*Significant P< 0.05

Table (4):- Shows relationship between children's frequency of follow up visits and demographic characteristics, the result revealed the difference between children's frequency of follow up visits and demographic characteristics was not statistically significant except for the relation with age in years as P value equal 0.041.

Table (5): Distribution of studied children in relation to duration of illness and daily activities

Variables	Duration of illness				X ²	p
	<15 months (n=58)		≥18 months (n=42)			
	n	%	n	%		
School absenteeism:					1.751	0.186
<3 days / month	34	58.6	19	45.2		
≥3 days / month	24	41.4	23	54.8		
Poor academic achievement					0.428	0.513
Yes	7	12.1	7	16.7		
No	51	87.9	35	83.3		
Disability with Walking	13	22.4	8	19.0	0.166	0.683
Disability with Playing	12	20.7	16	38.1	3.661	0.056
Disability with Studying	4	6.9	7	16.7	FE	0.194
Disability with Daily life activities	4	6.9	8	19.0	3.406	0.065
Disability with Cleaning teeth	9	15.5	9	21.4	0.577	0.448
Disability with Sleeping	6	10.3	4	9.5	FE	1.000
Disability with All of the above	27	46.5	17	40.5	0.365	0.546

*Significant P< 0.05

Table (5):- illustrates the distribution of studied children in relation to duration of illness and daily activities. The table illustrated that the difference between the distribution of studied children in relation to duration of illness and daily activities was not statistically significant.

Table (6) Relationship between children's physical exercise and body mass index

Having regular physical exercise	Body mass index						p
	Underweight		Normal weight		Overweight		
	n	%	n	%	n	%	
Yes	13	65.0	3	15.0	4	20.0	0.610
No	49	61.3	20	25.0	11	13.7	

*Significant $P < 0.05$

Table (6):- Represents relationship between children's physical exercise and body mass index. The table shows that the relationship between children's physical exercise and body mass index was not statistically significant as P value equal 0.610.

Table (7) Relationship between adherences with follow up and present complaint

Present symptoms	Adherent (n=65)		Not adherent (n=35)		χ^2	p
	n	%	n	%		
Difficulty breathing (n=18)	13	72.2	5	27.8	0.503	0.478
Easy fatigability (n=34)	23	67.6	11	32.4	0.195	0.690
Inability to play (n=31)	21	67.7	10	32.3	0.148	0.700
General weakness (n=20)	14	70.0	6	30.0	0.275	0.600
Poor academic achievements (n=14)	10	71.4	4	28.6	FE	0.765
Rapid heartbeats (n=27)	17	63.0	10	37.0	0.067	0.795
Dyspnea (n=15)	9	60.0	6	40.0	0.194	0.660
Tired of the rising (n=38)	25	65.8	13	34.2	0.017	0.897
Joints pains (n=32)	21	65.6	11	34.4	0.008	0.928
All of the above (n=56)	35	62.5	21	37.5	0.350	0.554

*Significant $P < 0.05$

Table (7):- Shows the relationship between adherences with follow up and present complaint. The findings revealed that the differences between adherences with follow up and present complaint was not statistically significant.

Discussion

Rheumatic fever (RF) is a major public health problem. It is an important cause of acquired cardiovascular disease in childhood and adolescence. Rheumatic heart disease is a major sequel and the primary cause of acquired valvular disease worldwide⁽¹⁸⁾. The present study aimed to assess the effect of rheumatic fever on the life style of primary school children aged (6-12) years.

Although the high prevalence of rheumatic fever in developing communities is mainly related to poverty and overcrowding, which favor the transmission of group A streptococcal infection especially in rural areas, this is contradicted with the present study which revealed that the majority of the studied children were from urban areas. The present results were in accordance with **Nikyar AL. (2002)**, who mentioned in a similar study that the majority of children in his study were from urban areas.

Regarding the age, the current study showed that more than half of studied children were at age group of 10-12 years, the current study results were in an agreement with **Essawy et. al., (2010)**, who stated that the age between 6-12 years is still carrying the highest risk for RF in our locality this may be due to, at these ages children are in schools which may be overcrowded and badly ventilated, so that, spread of streptococcal infections is high.

As regard gender nearly two thirds of the studied children were females. The study was highly supported by **Al- Munibari et. al., (2011), in Yemen**, who mentioned that the disease was significantly more prevalent among girls aged 10 to 12 years and most of them from rural area.

The result reflected that more than three quarters of the studied children's were living in a poor sanitary environment and their families composed of 5 members or more and their houses consists of only two rooms while, the monthly income of nearly half of them weren't enough. These findings were in accordance with **Al-Munibari et. al., (2011), in Yemen**, who reported that there was a significant correlation between socioeconomic level and the prevalence of RF, RHD, the high prevalence of RHD could be attributed largely to low standard of living.

The study finding indicated that nearly two thirds of the studied children's parents weren't relatives and having no family history regarding to RF. This result in contrast with **Denise et al., (2009), in Brazilian** who indicated that about two thirds of the studied children's parents were relatives and the great majority of them were having no family history regarding to rheumatic fever.

As regards the relation between age in years and dietary of the studied children, the current study result showed that there were statistically significant differences. On the other hand, there was a statistically significant difference ($P < 0.05$) between age of children and preference of certain types of banned food as fast food, stained deserts and preserved food and all banned types of banned food. This study was to some extent in accordance with the study of **Hassan .et. al.,(2006)**, who mentioned that there was a statistically significant difference between age of children, level of education and their different domains of quality of life.

As regards the relation between birth order and dietary habits of the studied children, the current study result showed that there was a statistically significant difference ($P < 0.05$) between ranking of the studied children with affection of the dietary habits and number of meals per day of children. However **Mostafa et al., (2008)**, didn't agreement with this result as he mentioned that there was no statistically significant relations were detected between gender, ranking of the studied children and their different domains of quality of life.

Considering the relation between mother's education and dietary habit's of the studied children, there were statistically significant differences ($P < 0.05$) between mother's education and dietary habit's of the studied children. This result was in accordance with **Toa T, (2009), in South Africa** as he mentioned that positive relations were found between mothers' level of education and their children physical, scholastic, social, emotional domains and total QOL of the studied children. However **Abu-Saad et. al., (2009), in Scandinavian** did not agreement with this result, who mentioned that the total quality of life was not affected by the level of education of parents.

This study finding clarified that there were no statistically significant differences between duration of illness of the studied children and their daily activities. This result in an agreement with **El-Nagar (2005)**, who mentioned that low level of education, income, and social status have previously been noted as factors related to the incidence of RHD.

In the current study it was found that the minority of the studied children with literate or illiterate fathers taken integrated meal. While, the majority of the studied children with literate or illiterate fathers taken none integrated meal. The present study revealed that there was a significant difference between father's education and dietary habits of the studied children. This clarifies that father's education affect the dietary habits of their children and they need further education especially if some of them were the care givers.

Conclusion

Rheumatic fever had an impact on the most of the life style of the children. It was found that rheumatic fever affected the dietary habits of the majority of the children with illiterate parents. Psychological state of most of the studied children was affected. About two third of children didn't participate in school activities. Nearly one third of them slept less than six hours per day. Children's frequency of follow up visits increased with age. The relationship between children's physical exercise and body mass index, the difference between the studied children in relation to duration of illness and daily activities were not statistically significant.

Recommendations

Based upon the results of the current study, the following recommendations are suggested:

- 1- Establishment of a health education program about rheumatic fever prevention, and plan to implement it in maternal and child health centers.
- 2- Planning for medical convoys, which required in targeting of the high risk individuals and populations, infected with group A streptococcal infections, RF and RHD.
- 3- Designing and carrying out education programs for children with rheumatic fever and their families about compliance with treatment to avoid complication of disease and improve their lifestyle.
- 4-Preparing school nurses with high level of efficiency, knowledge and practices to provide better care for children suffering from rheumatic fever through carrying out education programs.

5-It is necessary to establish a system to educate, monitor and evaluate the self control practices of children with rheumatic fever.

6- Health education messages about rheumatic fever in mass media especially radio and television, this message can be delivered to large sector of the community.

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