

# Prevalence of Rheumatic Heart Disease in different regions of Pakistan

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## ABSTRACT

**Aim:** To identify the increasing prevalence of rheumatic heart disease and their risk factors among children and adolescents in different population region of Pakistan.

**Methods:** Different electronic database were search for data on rheumatic disease prevalence among children and adolescents ( $\geq 6$  years to  $< 15$  years) between Jan 2000 to Dec 2016 in Pakistan on global health, google scholar and pubmed engines. We include 2000 patients data from different regions of all over Pakistan.

**Results:** We sort out 31 different researches and 17 articles matching the inclusion criteria on rheumatic heart disease. There are 23 different regions population were included in this systematic review and meta analysis. Most of the patients have facing multiple risk factors, whereas in 13 studies prevalence were measured by echocardiography, assessment of cardiac murmurs and cardiac auscultation for screening of patients with rheumatic heart diseases. Prevalence of rheumatic heart disease detected through cardiac auscultation was 14.6 per 900 patients (95% CI 1.2-5.0) and through echocardiography 16.2 per 1100 patients (7.3-14.7)..

**Conclusion:** We bring into being statistic that there is high prevalence of rheumatic heart disease in poorly health facilitate region of Pakistan. Anyhow the regions, where population are more educated and aware about risk factors have better diagnosis and quick treatment of rheumatic heart disease.

**Keywords:** Rheumatic heart disease, Adolescents, Pakistan

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## INTRODUCTION

Rheumatic heart disease has top position in the category of non communicable diseases specially in developing countries, where people have low income and unhygienic food and it is upto 200000 premature deaths worldwide every year<sup>1</sup>. In last few decade, in researches has developed to a many researches that demonstrate that huge burden of rheumatic heart disease is growing faster after 2003<sup>2</sup>. Anyhow no proper population based researches on incidence of acute fever have been documented from all over world<sup>3</sup>.

In this era of highly developed technology, inequality in social living standards and increasing poverty consider to be physical manifestation of acute rheumatic fever and rheumatic disease<sup>4</sup>. Rheumatic heart disease is going to be widespread in children aged between 12-16 years in low economic countries, where very low percentage of budget is spend on health sector, while it is almost eliminated in developed countries<sup>5</sup>. There is worldwide huge loss regarding cardiovascular disease is rheumatic heart disease with life span of 9-13 years, which -

going to become more challenging in developing countries like Pakistan<sup>6</sup>.

Rheumatic fever is originate from abnormality in autoimmune reaction from streptococcal pharyngitis group A, Which is appear as large joints arthritic changes, affects the valvular parts and cardiac inflammation, also affects skin and the brain<sup>7</sup>. The most quick and efficient therapeutic treatment for acute rheumatic fever and rheumatic heart disease is antibiotic prophylaxis<sup>8</sup>.

We endeavor to review the data from population in an observational based rheumatic heart disease in children and adolescents in developing country like in Pakistan and to notify treatment lapses<sup>9</sup>. More specifically, We aimed to identify the increasing prevalence of rheumatic heart disease and their risk factors among children and adolescents in different population region of Pakistan<sup>10</sup>.

## PATIENTS & METHODS

In this study, all the data were carefully and autonomously selected by three researchers. Any conflict in nomination of population area were solved by evidence base on different researches. In collection of data many socio-demographic variables and findings on prevalence were assessed, like sampling techniques, special care in data sorting and protocol of screening. Since no direct data analysis

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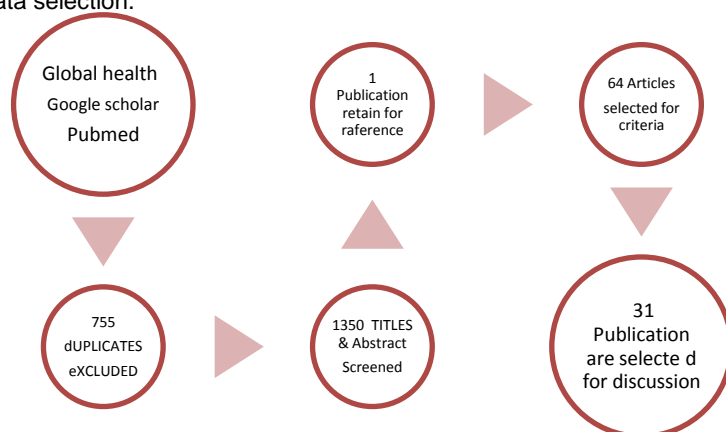
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and statistics are available for prevalence of rheumatic heart disease, then we decided the

to measure the prevalence using regression analysis.

Fig.1: Organogram of data selection.



Different electronic database were search for data on rheumatic disease prevalence among children and adolescents ( $\geq 6$  years to  $<15$  years) between Jan 2000 to Dec 2016 in pakistan on global health, google scholar and pubmed engines. We include 2000 patients data from different regions of all over Pakistan. We evaluate clinically silent and evident rheumatic heart disease in meta-analysis with different geological regions. We measure the raw data through meta analysis. Different estimates of analysis were measure on prevalence basis and then there confidence interval measure on throughout asymmetrical means. The approximation of rheumatic heart disease prevalence with age in two steps, as it is done for monitoring the age factor in variables. Age and sex were estimated for each region utilizing regression analysis. We notify direct involvement of social inequality and poor hygienic condition by using regression analysis.

## RESULTS

In recent decade many studies have been conducting on cardiac diseases are mainly depend on screening defining different reasons. We assess many patients including children and adolescents with heart murmurs and pathological problems are unaware of their problems and disease because of their low education and unaware of basic health issues in developing countries like Pakistan.

We sort out 31 different researches and 17 articles matching the inclusion criteria on rheumatic heart disease. There are 23 different regions population were included in this systematic review and meta analysis. Most of the patients have facing multiple risk factors, whereas in 13 studies prevalence were measured by echocardiography, assessment of cardiac murmurs and cardiac auscultation for screening of patients with rheumatic heart diseases. Prevalence of rheumatic heart disease detected through cardiac auscultation was 14.6 per 900 patients (95% CI 1.2-5.0) and through echocardiography 16.2 per 1100 patients (7.3-14.7). Findings were match in 30 studies. Cardiomyopathy were also noted in patients with growing age.

Table 1: Characteristic Baseline of Included Reasearches.

Reference	Screening Country	Year	Urban(%)	Sampling	Sample Size	Auscultation	Echo	Age Range
Agarwal et al	India	1991-1992	-	Community	1345	-	+	0-14
Ahmed et al	Bangladesh	1991	-	Community	5521	+	+	6-16
Gul et al	Pakistan	2007	92	Not defined	1523	-	+	4-13
Munibari et al	Yemen	1999	87	Schools	4500	-	+	NA
Pandey and Regmi	Nepal	1998	96	Schools	4300	-	+	4-14
Sadiq et al	Pakistan	2003	-	Schools	1700	+	-	3-14

## DISCUSSION

In this meta-analysis of all the population regions of Pakistan, after data analysis the regions with widespread prevalence of rheumatic heart disease<sup>11</sup>. Incidence of diseases is more and progressive in ages between 5-16 years, clinically diagnosed disease is less 7 times from clinically silent diseases, mark difference in disease diagnose in those population regions, where people are living at low socially developed areas and with less available health facilities<sup>12</sup>.

There is many researches and articles had found with to much less methods and statistical analysis with different population regions<sup>13</sup>. Many of them are under supremacy to review prevalence with precise results due to low population samples or participants<sup>10</sup>. Mostly the area were not defined properly in researches, it may be influence the future planning in future prevention of disease<sup>14</sup>.

Some researchers conduct study on basis of school sampling, which may be influence the results due to socioeconomic status which is directly related to affordability of educational expenditures<sup>15</sup>. Although on the sensitivity point of view, in most of researches no any proper interaction between prevalence in school as well as community based studies<sup>16</sup>.

Seckeler MD et al, they targeted the sensitivity and specificity of cardiac auscultation in sense of echocardiography for observation. Diagnosis, autonomous, assessments and diagnosis are involved in procedure<sup>17</sup>. On the other hand, in many studies different analysis of minor findings from screening perform by investigator<sup>18</sup>. Cover and uncovered diagnosis of all the samples were confirmed by their findings. In last few decades, the prevalence of rheumatic heart disease was declined by most declined due to its prevalence and silent features<sup>19</sup>.

Mahmoud U Sani et al reported a advanced dominance of rheumatic heart disease among children. In compare to results from past community-based researches in mainly in adults, they did not document differences in sex and socioeconomic status difference in prevalence of rheumatic heart disease, only based on primarily school-based observational studies<sup>20</sup>. A divergence in sex-related prevalence ratios between children and adults was defined under school population targeting mainly girls<sup>21</sup>. Since data on rheumatic heart disease surrounded by adults classically apparent disease as notice by auscultation, echocardiography, rather than to specific clinical disease and noted sex difference during auscultation in men and women<sup>22</sup>.

We noted a prevalence of rheumatic heart disease is more in that population regions, where socioeconomic ratio and literacy rate is low, it also depends on the availability of health facilities. During history taken in absence of acute rheumatic fever, a huge fraction of silent cases are present as latent disease.

## CONCLUSION

We bring into being statistic that there is high prevalence of rheumatic heart disease in poorly health facilitate region of Pakistan. Anyhow the regions, where population are more educated and aware about risk factors have better diagnosis and quick treatment of rheumatic heart disease. Although the importance of early stage detection of rheumatic heart disease, have to be further investigate.

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