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Causes of variability in prevalence rates of communicable diseases among school students in Pakistan

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Abstract
Objective: The aim of this study is to find out the causes of variability in prevalence rates of communicable diseases among school going students of Multan, in Pakistan.
Methodology: This case control trial was conducted in private and Govt. schools present in urban locality, Multan. This study was completed in 7 months (May 2016 to November 2016) and parents of all the students under trial were asked for informed consent. A total number of 100% (n=186) were taken in this study and online source Openepi.com was used for calculating sample size. All the students were selected by lottery method. Computer software SPSS version 23.2 was used for complete data entry and analysis. All the descriptive variables like onset of action and age were presented as SD and mean. Statistical test ANOVA was applied to find the significance among all groups. Chi square test was applied for analysis of continuous stats among groups. P value 0.05 was to be considered as significant.
Results: There were 100% (n=186) children, in this study. The mean age of the children was 7.79±1.55 years. (Range: 4 to 10years). There were 41.9% (n=78) children between 4-7 years and 58.1% (n=108) children between 8-10 years. There were 43.5% (n=81) males and 56.5% (n=105) females. There were 58.6% (n=109) children studied in government schools and 41.4% (n=77) studied in private schools. 44.6% (n=83) children belonged to urban areas and 55.4% (n=103) belonged to rural areas. Communicable diseases were noted, in the children, as TB 3.2% (n=6), diarrhea 32.3% (n=60), malaria 7% (n=13), flu 43% (n=80) and scabies 14.5% (n=27). Association was found between communicable disease with gender (p=0.049) and stratified age (p=0.000) except school type (p=0.915) and locality (p=0.221), according to chi-square.
Conclusion: The whole study reveals that the prevalence of diarrhea, TB, malaria, flu and scabies were higher in females comparative to male students. The communicable diseases prevalence was also higher in Govt. Schools than private sector.
Keywords: Variability, prevalence, correlation, communicable and school going.

Introduction:

Communicable diseases are contagious that spread from one person to another person[1]. There are various communicable diseases like malaria, measles, influenza, salmonella, flu, Hepatitis B, T.B, Ebola, H. Influenza type b and MRSA[2]. They are caused by virus, bacteria, fungi and parasites and they could easily be caught by other person by direct or indirect contact. They are spread through many ways such as breathing, contact with blood fluid, travel through air and by being bitten by insects. In developing countries i.e. Pakistan communicable diseases are still the main cause of desolate, murky and mortality in children[3]. This is incompatible to the groomed states where injuries are the main cause of disabilities and death. Besides the developments and discoveries of vaccines and antimicrobial treatments, it is surprising that communicable diseases still account for three over fourth of children mortality and morbidity in developing countries[4]. Unfortunately in the rank of top ten countries Pakistan is on eighth among them, Pakistan bears 90 percent of burden of communicable diseases. The main cause of death of over 60 to 70 percent children is communicable diseases. The symptoms of communicable diseases include fever, coughing, fatigue, muscles ache, headache, and fever[5].

Communicable diseases are the major children killers. Two third of children never see their sixth birthday. The mortality and desolate rate in Pakistani children is very high as 58.02, 77.84 and 95.89 per 1,000 live births of children under one month, one year, and five years respectively[6]. According to a research about 1.5 to 2 million children die of pneumonia, diarrhea and hepatitis B. These diseases kill 30 to 40% of children in Pakistan. In Diarrhea there is frequent discharge of liquid feces and it is a condition in which loose motion occurs. The death rate of children due to measles in Pakistan is near about 18000 to 22000 per year although vaccines for measles are also available. Like measles, Tuberculosis is a major killing disease in children. T.B is caused by Mycobacterium[7]. Its way of transmission is air. H. Influenza type b and Rota virus are also other communicable diseases which are the main cause off mortality and morbidity in children. Influenza is called ‘the flu’. Its symptoms include runny nose, coughing, fever and sore throat. It is caused by influenza virus. Scabies is highly communicable disease that is caused by Sarcoptes scabies[8]. Its transmission takes place from skin to skin and Its main symptom is severe itching. Its treatment includes tropical and oral drugs. Being a highly disaster prone

county contaminated water and floods affect different geographical zones and also damage the health infrastructure[9]. This is also problem in Pakistan especially with students, are at high risk of contracting communicable diseases. There is no national guideline to provide a structure for the care of public and secondary schools from these diseases. It is a big reason to worry about the students and their health. There is need to make polices to control the communicable diseases in students. And develop attainable intercede programs to address the communicable diseases load in schools[10].

Many studies have been done regarding the variability of prevalence of communicable diseases in school going student but no study has yet been done at local level and school going students are being neglected constantly. So, for this purpose trial has been designed.

Methodology:

After taking the ethical grant from the ethics authority of the all the schools respectively, this case control trial was conducted in private and Govt. schools present in urban locality, Multan. This study was completed in 7 months (May 2016 to November 2016) and parents of all the school under trial were asked for informed consent. Parents and students were also completely briefed about their participation in study, its procedure and its purpose also. A total number of 100% (n=186) were taken in this trial and online source Openepi.com was used for calculating sample size. All students were in inclusion criteria and those who were suffering from toxic disease; congenital disease, physical and mental disorder and malignant disease were excluded from the study. Hence, students were selected by using lottery method.

Many tools for data analysis and collections were used. Like use of a questionnaire to gather data and information on local schools level. The data and information include the size of school, location of school, morbidity and mortality of students, type of school, particularly hostels, hostels rooms including spacing between beds, the hostels mess including the crockery, the classrooms and the spacing between desks of classes all were observed by using an observation schedule. Trained group debate guide listen and collect data and information from various people to confirm data from local levels. Motive cases contain groups a communicable diseases regulation system and insight of skilled base knowledge. Some students never report about their clinically confirmed diseases in the questionnaire were taken to the nearest health facility for medical examination. The observed medical examination results and the test with blood slides for malaria were positive. Mycobacterium tuberculosis had a positive culture which confirms tuberculosis infection. A satisfactory sputum sample had more than 20 to 30 leukocytes and less then 15epithelial cells per minor field. Klebsiella, S. pneumonia and staphylococcus species were the majority frequent pathogens that were noticed. Sensitivity testing was performed for constructive outcome. Positive quick urine antigen testing is in favor of S. pneumonia. Positive stool tests for Clostridium difficile for respondent comprising diarrhea. Other tests done were an antigen test for rotavirus, antigen test for pathogen like Entamoeba, Parvum, Histolyca, and Giardia lamblia, ova and parasites examination.

All the data was properly recorded and Computer software SPSS version 23.2 was used for complete data entry and analysis. All the descriptive variables like onset of action and age were presented as SD and mean. Statistical test ANOVA was applied to find the significance among all groups. Chi square test was applied for analysis of continuous stats among groups. P value 0.05 was to be considered as significant.

Results:

Overall, there were 100% (n=186) children, in this study. The mean age of the children was 7.79±1.55 years. (Range: 4 to 10years). There were 41.9% (n=78) children between 4-7 years and 58.1% (n=108) children between 8-10 years. There were 43.5% (n=81) males and 56.5% (n=105) females. There were 58.6% (n=109) children studied in government schools and 41.4% (n=77) studied in private schools. 44.6% (n=83) children belonged to urban areas and 55.4% (n=103) belonged to rural areas.(Table. 1).

Communicable diseases were noted, in the children, as TB 3.2% (n=6), diarrhea 32.3% (n=60), malaria 7% (n=13), flu 43% (n=80) and scabies 14.5% (n=27) (Table. 3). Association was found between communicable disease with gender (p=0.049) and stratified age (p=0.000) except school type (p=0.915) and locality (p=0.221), according to chi-square. (Table. 2).

Table. 1: Demographic Variables: (n=186)

Characteristics	Frequency	Percentage (%)
Gender		
Male	81	43.5
Female	105	56.5
Total	**186**	**100.0**
School Type		
Government	109	58.6
Private	77	41.4
Total	**186**	**100.0**
Locality		
Urban	83	44.6
Rural	103	55.4
Total	**186**	**100.0**
Stratified Age		
4-7 years	78	41.9
8-10 years	108	58.1
Total	**186**	**100.0**
	Mean±S.D	
Age	7.79±1.55 years	

Table. 2: Association of Communicable Diseases with Gender, school type, Locality and age

Variable		Communicable disease					Total	P-value
		TB	Diarrhea	Malaria	Flu	Scabies		
Gender	Male	2	19	8	35	17	**81**	**0.049**
	Female	4	41	5	45	10	**105**	
Total		**6**	**60**	**13**	**80**	**27**	**186**	
School type	Govt.	4	34	9	47	15	**109**	**0.915**
	Private	2	26	4	33	12	**77**	
Total		**6**	**60**	**13**	**80**	**27**	**186**	
Locality	Rural	1	32	6	46	18	**103**	**0.221**
	Urban	5	28	7	34	9	**83**	
Total		**6**	**60**	**13**	**80**	**27**	**186**	
Stratified Age	4-7 years	6	60	12	0	0	**78**	**0.000**
	8-10 years	0	0	1	80	27	**108**	
Total		**6**	**60**	**13**	**80**	**27**	**186**	

Table. 3: Distribution of communicable Diseases

Disease	Frequency	Percentage (%)
TB	**6**	**3.2**
Diarrhea	**60**	**32.3**
Malaria	**13**	**7.0**
Flu	**80**	**43.0**
Scabies	**27**	**14.5**
Total	**186**	**100.0**

Discussion:

School children are foundation groups in the transmission of various communicable diseases, and are to play a basic role in the dispersal of disease across numerous scales[11]. However, there is currently little comprehensive information about the activities of this epidemiologically important age group. Major efforts have been made in current days to measure human communal incorporation patterns with a view to improving our perceptive of the transmission dynamics of disease[12]. There has been a particular focus on enumerating the sum of relations between different age groups. Studies have consistently shown that school-aged children make large numbers of communal associates, principally with other school-aged children.

Many studies have been done on causes of variability in prevalence rates of communicable diseases among school students[13]. These studies also explain that school going students transmit the communicable diseases[6]. Some of these studies are mentioned below.

A recent study was done in 2017 by Walker et al[14]; the aim was to know the prevalence and association with health-related quality and scabies in school going children in southern Ethiopia. This result explains a high prevalence of skin disorders affecting students attending the Adam School, Ethiopia. The data are consistent with previous studies of schoolchildren in Ethiopia and demonstrate high levels fungal infections. Acne and Alba were also common in the students. And one main point was the gender difference boys were more likely to be affected than girls. Scabies was diagnosed in 19 (15.5%) students (n=19) out of 122 students (n=1220. The consequences of this study resemble to a large extent to our results. In our study the total number of students were 186 (n=186) out of 186 students 27 (n=27) were effected with scabies. The results were 14.5%. So, our study explains Scabies is a skin disease that, through minor bacteria can lead to severe difficulties in students.

David Otieno Odongo et al studied tuberculosis in 2016, this explained that Tuberculosis had been more challenging, with high tuberculosis (TB) prevalence of 319 per 10,000 students. The results of this study were 3.3%[1].

Hans J. Overgaard et al studied diarrhea in school going children in 2016, they observed 28% students were affected by diarrhea. The results of this study match with the results of our study[15].

There is Another study by Edward Goldstein in 2017 on influenza, in this study there were students of age 14-17 years for 7 (n=7) out of 15 (n=15) mean 46% students were caught by influenza[16]. This study also resembles with our results. As table 3 explains that 43% (n=80) students effected with flu. In all communicable diseases flu spreads around the world in a yearly outbreak resulting in about three to five million cases of severe illness and about 250,000 to 500,000 deaths in children[17].

The study on transmission of malaria by Janitor Nankabirwa and Simon J. Broker et al; in 2014 got amazing results[18]. The result of this study was 5.5%. In which the student of age 7 to 15 years were noticed[19]. This study resembles with our results.
All these studies show that there is large prevalence rate of communicable diseases in school going children and mostly this large epidemiological group is being ignored constantly.

Conclusion:

The whole study reveals that the prevalence of diarrhea, TB, malaria, flu and scabies were higher in females comparative to male students. The communicable disease prevalence was higher in Govt School than private sector.

Limitation:

This trial was designed on local level and small numbers of the school going students were included in this trial. For better results and recommendations more studies are recommended of other students and schools.

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