Prevalence of communicable and non-communicable diseases among school going children

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Abstract

This study was aimed to assess the social concerns of parents on healthcare of their children and the prevalence of communicable and non-communicable diseases in children from private or public schools. This was a retrospective study. The study site comprises of public and private schools of Okara district. Those people who had the selected diseases were included in the study while others were excluded. The study duration was 1 year. A questionire based performa was designed to collect information from different schools of Okara district. The prevalence of communicable diseases and non-communicable diseases was assessed. Descriptive statistics was applied through Minitab (V9). The significance ($p< 0.05$) was measured through one-way ANOVA and the difference of data distribution was analyzed by using Chi-square test. A total of 962 individuals were surveyed. Out of 962 (n=156, 16.21%) have communicable diseases and (n=213, 22.14%) have non-communicable diseases. The age group 6-12 years mostly affected from communicable diseases and non-communicable shows significant impact on the

prevalence. The children with good hygienic conditions were less affected from communicable diseases and those with physically more active were less affective from non-communicable diseases. To conclude, the prevalence rate of non-communicable diseases was high in school going children than communicable diseases. Influenza in communicable diseases and cough in non-communicable diseases shows high prevalence. Tension, sleep disorder, headache and fatigue were associated with both diseases. It is necessary to spread the knowledge about diseases to children.

Keywords: Communicable diseases, Non-communicable diseases, Children, Private, Public

Introduction

An abnormal condition that can badly damage or adversely affect the whole body including the structure and functions of all parts of the body of any organism is called disease (1, 2). Some diseases are communicable diseases, which mean that they can be transferable and can be spreadable from one person to another person. Many diseases are known as non-communicable diseases, which means that they will not transferred from one person to another person. Communicable diseases are more common in children's than the non-communicable diseases. The children, especially school going and some children in care centres, kids are believed to be having more infectious diseases. Social contact among students can enhance the chance of spreading the infectious diseases. Touch, contact, sneezing or sharing food and other items are the source of communicable diseases (3).

Currently, illnesses caused due to communicable diseases are more common. In order to control this type of health issue, efforts are required to be made at international level (4, 5). As such efforts were made to detect and overcome the communicable diseases. Some communicable diseases are again re-emerging including drug resistant Tuberculosis (TB), Ebola and Severe Acute Respiratory Syndrome (SARS). Due to increased rate of re-emerging diseases, Health Department is supposed to have more information on surveillance of communicable diseases (6).

On global scale, the estimated value and spread of non-communicable diseases (NCDs) has been increased (7-10). Due to poor and less educated people or groups, there is elevation in the burden of NCDs known as non-communicable diseases in the developing countries, (11, 12) which is an alarming situation for these countries. To control this alarming situation, some proper policies have also been devised. In some of the developing countries, there is high

mortality rate due to communicable diseases; whereas, the existence of non-communicable diseases is more. (7, 9). In Pakistan, the urban areas are supposed to have high risk factors for the spread of non-communicable diseases (13). In a research conducted in 2010, it was noticed by Lozano and colleagues (14) that the burden of NCDs, non-communicable diseases is more than the communicable diseases (CDs). All around the world, the death rate observed was due to non-communicable diseases which include diabetes, respiratory illness or respiratory diseases, cardiovascular diseases and cancer. Pakistan undergoes double load of communicable diseases CDs and non-communicable diseases NCDs. This considered as a very critical problem in the health system, and Pakistani health system is not prepared to overcome the diseases like non-communicable diseases (15). This study was aimed to assess the social concerns of parents on healthcare of their children and the prevalence of communicable and non-communicable diseases in children from private or public schools.

Materials and methods

Study area

The study data was collected from the private and Government schools with the help of school teachers and student's parents in district Okara. A questionnaire based survey was conducted in primary sections of different educational institutes to collect the data. Field work for the entire research was conducted from October 2021 to October, 2022. A consent form was signed during interview.

Study population

About 962 samples were collected with the help of teachers and parents of students. This is a survey based study that collected quantitative information from children, which were less than 18 years and their parents or caregivers of young ones with non-communicable and communicable diseases in different schools of Okara, Pakistan.

Ethical Approval

The ethical approval with reference no. UO/DOZ/2022/IA was obtained from the institutional reiew board, University of Okara, Pakistan to conduct this study.

Inclusion and exclusion criteria

Those people who had the selected diseases were included in the study while others were excluded.

Data collection

Data was collected through self-constructed questionnaire, interviews and before starting field work pilot testing was performed to ensure validity and viability of the questionnaire.

A wide survey based study was conducted from different private and government schools of Okara, Pakistan. This study was conducted on primary school going children.

Interviews were conducted from the 962 sampled individuals, from class teachers and also from their parents, and a survey form was distributed to the parent's, children's and staff of the school to collect information regarding different communicable diseases like chicken pox, common cold, flu/influenza, scabies/skin allergy, typhoid, pneumonia, measles, itching and different non-communicable diseases like coughing, fever, obesity, low eye sight, ear/eye/throat infection, loose motions, tonsils, boil on hand/arm/leg/foot and stomach issues (vomiting, griping food allergy) in the children. A structured questionnaire was used for the collection of data among the school going children. The collection of data was based on the socio-demographic characteristics of parents and their children. Views of teachers, parents and the views of care givers of children on the social domains and on the health regarding non-communicable and communicable diseases in children were also assessed. In this analysis besides the questionnaire, personal information of children and demographic information of their parents were also be analyzed.

In this study participants were asked different questions relating spread of communicable and non-communicable diseases like water source, diet taken by the sampled individuals, status of hygiene and cleanliness of children and their homes, physical activity of child, participation of child in extra-curricular activities and rating of local hospitals on health care were also analysed.

Statistical Analysis

Descriptive statistics, at the end was applied to the collected data through Minitab (V9). Furthermore, for the significance ($p< 0.05$) will be measured through one-way ANOVA and the difference of data distribution was analyzed by using Chi-square test (16).

Results

Demographic characteristics of sampled population:

Total 962 students along with their class teachers and parents were participated in this survey-based research. Sampled individuals were taken from private and government schools (only

Primary level). This survey based study covers the prevalence of communicable and non-communicable diseases in school going children along with their risk factors.

Out of 962 participants (51.0%) were male and (49.0%) were female individuals, who were participated in this research. The sampled participants were divided into three age groups. First age group comprised 1-5 years contains (8.73%) individuals, second age group comprised 6-12 years contains (79.31%) individuals, and third age group comprised above 12 years contains (12.0%) individuals. The educational background shows that (62.3%) of participant's parents were educated and (37.7%) of participant's parents were illiterate or uneducated.

In this survey based study different private and public schools were selected and this research was conducted only in primary sections (class Nursery – class five) of those schools. Nursery class comprised of (6.4%) participants, class one comprised of (24.0%) participants, class two comprised of (23.7%) participants, class three comprised of (22.7%) participants, class four comprised of (14.2%) participants and class five comprised of (8.9%) participants.

The (41.5%) were from public sector schools and (58.5%) were from private sector schools. Residential status shows (36.4%) were from rural areas and (63.6%) were from urban areas of District Okara.

Gender wise distribution of individuals

Over all 491 participants were male and 471 were females participants. Age group 6-12 years have higher number of males and females participants (38.0%) and (41.4%) respectively. The (33.9%) of males belonged to educated families and (17.2%) belonged to uneducated background. Higher number of females participants were found in public sector (21.6%) than males (19.9%). In private sectors higher number of male participants (31.2%) were from private sector than females (27.3%). More females belong to rural areas while males belong to urban areas as shown in Table: 1.

Table 1: Gender wise distribution of individuals

Individuals Characteristics	Individuals				Total	
	Male (N=491)		Female (N=471)		N=962	
	N	%	N	%	N	%
Age group						
1-5 years	61	6.3	23	2.4	84	8.7
6-12 years	365	38	398	41.4	763	79.3
Above 12 years	65	6.8	50	5.2	115	12
Education background						
Educated	326	33.9	273	28.4	599	62.3
Uneducated	165	17.2	198	20.6	363	37.7
Class						
Nursery	11	1.1	51	5.3	62	6.4
Class 1	139	14.4	90	9.4	231	24
Class 2	136	14.1	92	9.5	228	23.7
Class 3	135	14	83	8.6	218	22.7
Class 4	49	5.1	88	9.1	137	14.2
Class 5	19	2	67	7	86	8.9
School						
Public	191	19.9	208	21.6	399	41.5
Private	300	31.2	263	27.3	563	58.5
Residence						
Rural	139	14.4	211	21.9	350	36.4
Urban	352	36.6	260	27	612	63.6

Type of food selection of individuals

Table 2 represented the comparison between healthy and unhealthy food. Individuals were divided into two categories i.e. healthy food eaters and junk food eaters. Among all individuals

junk food eaters (52.3%) were more than the healthy food eaters (47.7%). The p-value is less than 0.01. Age group of individuals have p-value 0.004, it means that age group have high significance impact on the type of food eaters. Higher number of males (60.03%) were eating junk food than females (39.96%). Similarly, higher number of females (58.82%) were eating healthy food than males (41.17%). Age group 6-12 years comprised of higher number of junk food eaters (81.31%) than the healthy food eaters (77.12%). Educational background does not have significant impact as p-value is 0.428. Higher number of educated parents (74.75%) provide their children junk food while lesser number of uneducated parents (25.24%) feed their children junk food. Higher number of individuals (54.07%) from private sector were eating junk food as compared to public sectors (45.92%). Type of sector also has highly significance impact on the type of food eating as the p-value is 0.003 as shown in table 2.

Table 2: Food comparison of individuals among all sociodemographic variables

Participants Characteristics	**Junk food (N=503)**		**Healthy food (N= 459)**		**X^2**	**P-value**
	N	**%**	**N**	**%**		
Gender						
Male	302	60.03	189	41.17	34.17	0.001**
Female	201	39.96	270	58.82		
Age group						
1-5 years	64	12.72	20	4.35	0.326	0.004**
6-12 years	409	81.31	354	77.12		
Above 12 years	30	5.96	85	18.51		
Education background						
Educated	376	74.75	223	48.58	69.94	0.428
Uneducated	127	25.24	236	51.41		
Class						
Nursery	31	6.16	31	6.75	3.508	0.143
Class 1	158	31.41	73	15.9		
Class 2	154	30.61	74	16.12		
Class 3	74	14.71	144	31.37		

Class 4	53	10.53	84	18.3		
Class 5	33	6.56	53	11.54		
Sector						
Public	231	45.92	168	36.6	8.594	0.003**
Private	272	54.07	291	63.39		
Residence						
Rural	181	35.98	169	36.81	0.072	0.083
Urban	322	64.01	290	63.18		
**= Highly significant (p-value<0.01); * = significant (p-value<0.05); NS= N0n-significant (p-value>0.05), X^2=Chi-square						

Prevalence of communicable diseases

We investigated the prevalence rate of communicable diseases (chicken pox, common cold, influenza, scabies, typhoid, pneumonia, and measles) in the school going children (public and private sectors).

A total of 962 individuals were surveyed from the primary portions of schools. The (16.21%) of participated individuals have communicable diseases including chicken pox (0.42%), common cold (4.36%), influenza (7.69%), scabies (2.28%), typhoid (0.21%), pneumonia (0.62%), measles (0.62%).

Among both genders prevalence rate of communicable diseases was higher in females (11.53%) as compared to males (4.67%). Among age groups higher prevalence rate was noticed in the age group 6-12 years (13.41%) and lower prevalence rate was found in age group above 12-years (0.83%) and (1.97%) of individuals were effected from communicable diseases in age group 1-5 years.

It was observed that (0.81%) individuals were affected from chicken pox. Higher number of males were effected from chicken pox (0.81%). Among age groups higher number of individuals belonged to age group 6-12 years (0.39%). Higher number of individuals belonged to educated families (0.51%) than the uneducated families (0.27%). Higher number of individuals belonged to class four (1.45%).

Total (6.3%) participants were affected from common cold. Higher number of individuals were females (7.64%) than males (1.22%). Among age groups higher number of individuals

belonged to age group 6-12 years (4.32%).Higher number of individuals belonged to educated families (3.67%) than the uneducated families (5.5%). High prevalence rate was found in class Nursery (21%) and lower in class five (2.32%). Higher number of individuals were from public sector (5.4%) and lower from private sector (1.42%). Higher number of individuals belonged to rural areas (9.71%) and lower from urban areas (1.3%).

Total (11.2%) participants were affected from influenza. Females were more then males. Patients with age group 6-12 years were more then others. Educated families (7.01%) were more than uneducated families (8.81%). High prevalence rate was found in class Nursery (40.30%) and lower in class five (1.16%). Public schools (13.0%) participants were more then private sector (3.9%). Higher number of individuals belonged to rural areas (14.9%) and lower from urban areas (3.59%).

Total (3.3%) participants were affected from scabies. Females were more then males. Patients with age group 6-12 years were more then others. Educated families were more than uneducated families. High prevalence rate was found in class one (2.59%) and lower in class five (1.16%). Higher number of individuals were from public sector (3.25%) and lower from private sector (1.59%).

Total 6 (0.9%) participants were affected from measles. Out of 6 individuals , higher number of individuals were males (1.01%) than females (0.21%). Patients with age group 6-12 years were more then others. Educated families were more than uneducated families. High prevalence rate was found in class three (1.37%) and lower in class nursery (1.61%). This is shown in table 1 also shown in figure 1.

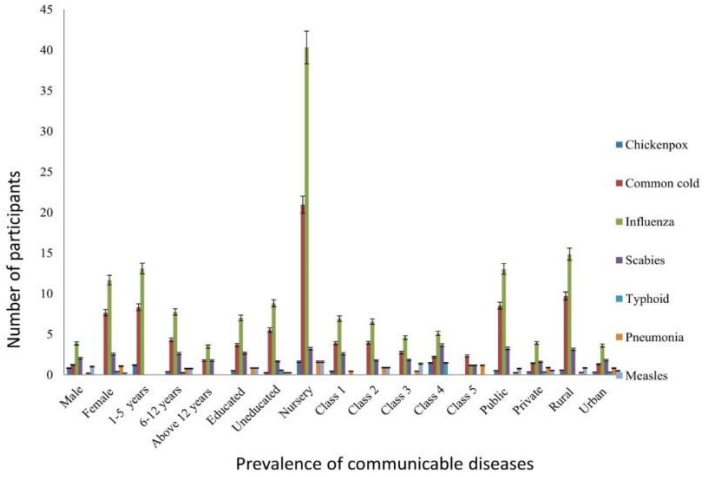

Figure 1: Prevalence of communicable diseases

Prevalence of non-communicable diseases

We investigated the prevalence of non-communicable diseases (griping, vomiting, coughing, fever, obesity, low eye sight and loose motions) in the school going children of public and private sectors. A total of 962 individuals from the schools were surveyed. The (22.14%) of individuals have non-communicable diseases including coughing (7.69%), stomach issues like griping, vomiting (1.35%), fever (5.61%), obesity (0.93%), low eye sight (6.3%) and loose motions (2.18%).

Among both genders prevalence rate of non-communicable diseases was higher in females than males. Among age groups higher prevalence rate was noticed in 6-12 years and lower in age group above 12-years. It was shown that higher prevalence rate was found in those participants who belonged to educated families than uneducated background. Higher prevalence rate was noticed in class Nursery than class five. Among public and private sectors higher prevalence rate of non-communicable diseases was found in public schools than private schools. Similarly participants belonged to rural areas was more than urban areas. The (7.69%) individuals were affected from cough. Females were more than males. Among age groups higher number of individuals belonged to age group 6-12 years and shows significant impact on the prevalence of NCDs. Higher number of individuals belonged to educated families. Higher prevalence rate was found in class Nursery than class five. Higher prevalence rate was noticed in public schools than private sectors. Rural areas were affected more than urban areas. The total (1.35%) patients were affected from stomach problem. Higher number of individuals were males than females. Among age groups higher number of individuals belonged to age group 6-12. Higher number of individuals belonged to educated families. Higher prevalence rate was found in class one and lower in class Nursery. Urban areas were more affected than rural areas. About (5.61%) individuals were affected from fever. Females were more prevelant than males. Among age groups higher number of individuals belonged to age group 6-12 years. Educated families were more frequent than uneducated. Higher prevalence rate was found in class Nursery and lower in class five. Public schools were more affected than private schools. Rural area were more affected than urban areas

Obesity was found in (0.93%) individuals. More cases were of females than males. Among age groups higher number of individuals belonged to age group 6-12 years and lower in age group 1-5 years. Higher number of individuals belong to educated families. Higher prevalence

rate was found in class four and lower in class five. Public schools were more affected than private schools. Urban area were more affected than rural areas.

Cough comprises of (6.3%) individuals. All other parameters were same like obesity. Rural area were more affected than urban areas Loose motions were found in (2.18%) individuals. All other parameters were same like cough. Higher prevalence rate was found in class Two (n=11, 4.82%) and lower in class four (n=1, 0.73%). This is shown in table 2 in supplementary material. Urban area were more affected than rural areas. The graphical representation of prevalence of non-communicable diseases is shown in figure 2.

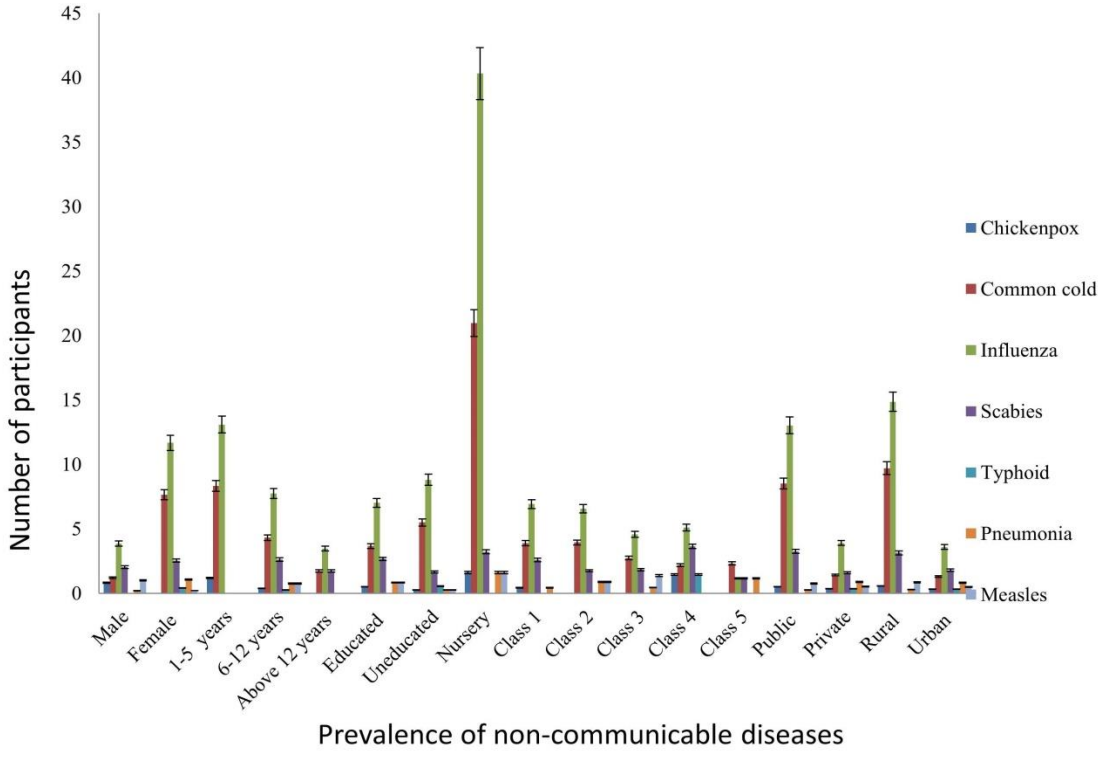

Figure 2: Prevalence of non-communicable diseases

Factors associated with communicable and non-communicable diseases

Drinking clean water can save us from many diseases. Source of water plays a role in the spread of diseases especially the water born diseases. In this study most of individuals use tap water for drinking purpose which may be clean or not. Poor hygienic condition of children along with their homes also contributes in the spreading of communicable diseases. The total of 75.77% individuals do not wash their hands regularly which plays an important role in the spreading of communicable diseases through touch or direct contact and 54.36% participants do not care about their personal cleanliness and hygiene which also enhance the spread risk of communicable diseases.

Junk food is very common in Pakistan. Excess use of unhealthy diet can lead to obesity, tension, fatigue and many other diseases relating non-communicable diseases. The total of 63.31% participated individuals were inactive in studies and 45.63% suffer from stressed conditions. Total (38.35%) participants actively participated in co-curricular activities while the rest were not and 48.33% were found physically inactive, (78.89%) of participated

individuals take unhealthy diet. 52.28% individuals perform daily exercise. This is shown in table 3.

Table 3: Factors associated with communicable and non-communicable diseases

Risk factors associated with communicable diseases	**N**	**%**
Source Of Water		
Use Of Tap Water	612	63.61
Use Of Filtered Water	350	36.38
Family System		
Joint Family System	399	41.47
Separate Home	563	58.52
Status Of Hygiene And Cleanliness Of Children		
Good	439	45.63
Poor	523	54.36
Status Of Hygiene And Cleanliness Of Children Home		
Good	435	45.21
Poor	527	54.78
Take Shower Regularly		
Yes	512	53.22
No	450	46.77
Cut Nails Regularly		
Yes	662	68.81
No	300	31.18
Wash Hands Regularly		
Yes	233	24.22
No	729	75.77
Brush Teeth Regularly		
Yes	560	58.21
No	402	41.78
Risk factors associated with non-communicable diseases	**N**	**%**
inactive in studies	609	63.3

mentally stressed	439	45.63
participation in co-curricular activities	369	38.35
active in playing games	519	53.95
physically inactive	465	48.33
family history of any disease	396	41.16
take unhealthy diet	759	78.89
perform daily exercise	503	52.28

Discussion

This survey based study covers the type of food eaters (healthy and junk food eaters) and associated risk factors with the communicable as well as non-communicable diseases. Male and female students were participated in this study from the public sectors as well as private educational institutes.

Among all the individuals, the survey based study conducted showed that out of 962 participated individuals (school going children) prevalence of communicable diseases was 16.21% and prevalence of non-communicable diseases was 22.14%. More number of individuals was affected from non-communicable diseases than the communicable diseases.

In this study the prevalence rate of non-communicable diseases was found higher than the communicable diseases as in (17) that describes the status of communicable and non communicable diseases and their prevalence along with their risk factors. A total of 962 individuals were surveyed from the primary portions of schools. 156 (16.21%) of participated individuals have communicable diseases. The prevalence of chicken pox is (n=4, 0.42%), (18, 19) the prevalence of common cold (n=42, 4.36%), (20) the prevalence of influenza (n=74, 7.69%), (21) the prevalence of scabies (n=22, 2.28%), (22) the prevalence of typhoid (n=2, 0.21%), (23) the prevalence of pneumonia (n=6, 0.62%) (24), the prevalence of measles (n=6, 0.62%). (25)

Gender has significant impact on the prevalence of communicable diseases as higher prevalence rate was noticed in females (n=111, 11.53%) than males (n=45, 4.67%) as (26) also described in his study that more females were effected from the communicable diseases than the males. The burden of communicable diseases was found higher in females than males (27). Prevalence of communicable diseases is more common in children who are less than 15 years. More children were effected from communicable diseases who are less than 15 years (28) as

described by Grisotti. Similar to this, my study also tells the same thing that the prevalence of communicable diseases was higher in 6-12 years. The higher prevalence rate was noticed in age group 6-12 years (n=129,) the present study showed that the age group of participated individuals has significant impact on the prevalence of communicable diseases as the p-vale is 0.052. Higher number of participated individuals belonged to class nursery that fall in this age group 6-12 years. In current study public sectors are more vulnerable to communicable diseases than the private institutes as the hygienic condition of children as well as their homes also plays an important role in spreading of communicable diseases. Similarly participants belonged to rural areas has higher prevalence rate of communicable diseases than the urban areas (29). Many other studies show the negative association between rural, urban areas and public, private sectors as Grisotti (2010) tells in his studies.

Total of 213 (22.14%) of participated individuals have non-communicable diseases. The prevalence of coughing (n=74, 7.69%), (30) the prevalence of stomach issues like griping, vomiting (n=13, 1.35%), (31) fever (n=54, 5.61%), (32-34) the prevalence of obesity (n=9, 0.93%), (35-37) the prevalence of low eye sight (n=42, 6.3%) and the prevalence of loose motions (n=21, 2.18%) was observed. The prevalence of non-communicable diseases was different in different studies as in. (38, 39) which show the prevalence of other different non-communicable diseases in their studies.

Among both genders prevalence rate of non-communicable diseases was higher in females (n=161, 16.73%) than males (n=52, 5.4%). Among age groups higher prevalence rate was noticed in 6-12 years (n=168, 17.46%) and lower prevalence rate was found in age group above 12-years (n=15, 1.56%). Age group has significant impact on the prevalence rate of non-communicable diseases as p-value is 0.044 as. (40) discussed in their studies that prevalence rate of diseases is higher in females but many other factors included which was different from my studies like risk factors and mainly the area wise distribution of diseases (41). In this study the prevalence rate was higher in those participants who belonged to educated families (n=126, 13.09%) than those who belonged to uneducated background (n=87, 9.04%) (42). Higher prevalence rate was noticed in class Nursery (n=58, 6.02%) because most of the students fall in the age 6-12 years age group. Among public and private sectors higher prevalence rate of non-communicable diseases was found in public schools (n=130, 13.51%) than the private schools (n=83, 8.62%) (43). Similarly participants belonged to rural areas (n=132, 13.72%)

has higher prevalence rate of non-communicable diseases than those belonged to urban areas (n=81, 8.42%) with p-value 0.481 but these results found opposite in the study, (44) who tells us the prevalence of diseases in the semi-urban areas.

Conclusion

To conclude, the participants who were in good hygienic conditions were found far away from these communicable diseases and who were physically more active found less affective from non-communicable diseases. The overall prevalence rate of non-communicable diseases was found higher in school going children than communicable diseases. Influenza in communicable disease and cough (respiratory infection) in non-communicable disease has high prevalence in the school going children. Tension, sleep disorder, headache and fatigue were associated with CDs as well as NCDs. It is necessary to spread the knowledge about CDs and NCDs to school going children. To drink high quality water and taking good diet along with increased physical activity in schools can reduce the risk of non-communicable diseases among children.

Ethical concerns

Conflict of interest:

Authors declare no conflict of interest.

Human and animal subjects

The study was conducted according to the declaration of Helsinki.

Consent to participate publication

The consent form was obtained from patients to participate in work and also publish it.

Source of funding for the work

Not applicable

Data availability

Data will be available online and also anytime.

Author contributions

All authors contributed equally.

List of abbreviations

CDs: Communicable diseases

NCDs: Non-communicable diseases

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