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# A case control study to assess the risk factor of childhood Tuberculosis among children (1-14 yrs) in District Government Headquarters Hospital,Cuddalore

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**ABSTRACT**
*Tuberculosis is an ongoing chronic infection caused by mycobacterium tuberculosis. The risk factor of TB infection is same in both children and adults. Though, children carry much of the impact on the disease. Hence, we explored the risk factors for childhood tuberculosis. A total of 104 children, case-52, control-52, were selected by using Random sampling technique. The quantitative approach was used in this study. Study was conducted among children with tuberculosis and children came for Mantoux test are the controls. The samples were interviewed for risk assessment around 30 minutes in both hospital and home. The collected data were analysed to find out the association of risk factors by using Odd's Ratio. The risk factors were assessed by using check list and data collected were analysed by using descriptive and inferential statistics. Each group 31 (59.6%) ,23 (44.2%) was no contact with the TB cases. In Both the group 30 (57.7%) are no contact with the TB patients compared to Control 28 (53.8%) less than 2 years contact. 20 (38.5%) cases were under III$^{rd}$ degree malnutrition 19 (36.5%) control under II$^{nd}$ degree malnutrition. Majority 27 (51.9%) in case and 30 (57.7%) in control not taken worms treatment regularly. 33 (63.5%) in case and 30 (57.7%) in control were given breast feeding up to 1 year. In Case 37 (71.2%), in Control 37 (71.2%) were no habit of smoking. In both the group 28 (53.8%) ,18 (34.6%) was 7-7.9mg of haemoglobin level. Children with III $^{rd}$ degree malnutrition were more risk of getting disease than the control group. The children with 7-7.9 mg haemoglobin level were the risk factors for the tuberculosis.*
***Keywords:*** *Childhood Tuberculosis, Assess, Risk Factors, Case, Control.*

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## INTRODUCTION

Tuberculosis is an ongoing chronic infection caused by mycobacterium tuberculosis. It generally infects the lungs and other organs such as the kidneys, brain or spine. The disease most often spread through droplets breathed or coughed into the air. A child can be infected with the TB bacteria and not have active disease [1].The risk factor of TB infection is same in both children and adults. Though, children carry much of the impact on the disease because they are easily infected by household contact with infected adults, mostly their parents/grandparents. Normally, young children aged 0-4 years are the most susceptible to the disease due to vulnerability of their immune systems.A small portion of children with TB (generally elder children) develop post-primary TB besides due to reactivation in the lungs [2,3].Tuberculosis is one of the most important infectious causes of maternal mortality globally and accounts for 16% of all maternal deaths. India provided to nearly 21% of the global burden of TB among pregnant women and they estimated commonly TB stands at 2.3 per 1000 pregnant women, which transfer to about 44,500 patients annually [4,5].India has the highest burden of the disease and multidrug-resistant TB, approximately more than 2.2 million TB cases and 71000 cases of MDR-TB (defined as TB resistant to at least isoniazid and rifampicin). Subnational drug resistance surveys reported MDR-TB incidence rates among previously treated cases of 12-17% [6].

## MATERIAL AND METHODS

The quantitative approach was used in this study. Study was conducted among children with tuberculosis and children came for Mantoux test are the controls. A total of 104 children, case-52, control-52, were selected by using Random sampling technique. The samples were interviewed for risk assessment around 30 minutes in both hospital and home. The collected data were analysed to find out the association of risk factors by using Odd's Ratio. The risk factors were assessed by using check list and data collected were analysed by using descriptive and inferential statistics [7].

The purpose of this study was to assess the risk factors of childhood tuberculosis among children (1-14 yrs.) in selected hospital. The purpose and duration of study was explained to the parents. After obtaining the informed written consent, the baseline variables were collected. The study was conducted for a period of one month. Privacy during data collection procedure was maintained and also assured confidentiality regarding the information received. The collected data was organized, tabulated, and analysed by using odd's ratio. The inferential statistics such as chi-square and P-value were used. The chi- square was used to find out the association between the demographic variables and the risk factors. They were planned to present in the form of tables and figures [8].

## RESULTS

The findings reveal thatthe demographic profile, the percentage in case 23 (44.2%) were 1-5 years. In control 16 (30.8%) of 1-5 yrs, 5 (11.5%) and 16 (30.8%) are 11-14 year. It interpreted that majority (44.2%) of the children belongs to the age group of 1-5 yrs.

It shows that 26 (50.0%) of children in both the group case and control are male and female respectively. In both Case- 45 (86.5%) and Control group - 46 (88.5%) were Hindu. In both group case and control 49 (94.2%) were rural and 3 (5.8%) were urban. It interpreted that majority (94.2%) of children living in rural area. In group Case 22 (42.3%) were kinder garden, In Control group - 27 (51.9%) were kinder garden, it interpreted that majority (51.9%) of the children studying kinder garden.

In Mothers education status, 21 (40.4%) were high school in case and in Control group- 15 (28.8%) were studied primary education,15 (28.8%) were higher secondary. It interpreted that majority (40.4%) of the mother were studied high school.

In both the group majority (94.2%) of children living in rural area.

Frequency and percentage wise distribution of children according to their children's education. In group Case 22 (42.3%) were kinder garden. In Control group - 27 (51.9%) were kinder garden. It interpreted that majority (51.9%) of the children studying kinder garden. According to father's education., in Case, 18 (34.6%) were high school, in Control group, 21 (40.4%) were high school. It interpreted that majority (40.4%) were studied high school.

In Case 37 (71.2%) were nuclear family. In Control group 31 (59.6%) were nuclear family. It interpreted that majority (71.2%) were nuclear family. In Case 45 (86.5%) presence of smoke outlet, in Control 49 (94.2%) presence of smoke outlet. It interpreted that majority (94.2%) having smoke outlet in their houses.

In both the group Case and control 34 (65.4%), 34 (65.4%) having single bedroom It interpreted that majority (65.4%) having single bedroom. In Case 16 (30.8%) were contact in the family and 31 (59.6%) were no contact. In Control- 24 (46.2%) were contact of disease from the family itself, It interpreted that majority (59.6%) were no contact with the disease. According to nutritional assessment. In Case 20 (38.5%) were III$^{rd}$ degree malnutrition and In Control 19 (36.5%) under II$^{nd}$ degree malnutrition. It interpreted that majority (38.5%) were under the III rd degree malnutrition. In Case and Control 51 (98.1%) ,48 (92.3%) absence of asthma history. It interpreted that majority (98.1%) of parents did not having the asthma history.

Breast feeding up to 1 year in Case, 33 (63.5%), in control group, 30 (57.7%). In Case 37 (71.2%) are no habit of smoking. 37 (71.2%) are no habit of smoking in control group. It interpreted that majority (71.2%) were no habit of smoking.

In Case 22 (42.3%) using cylinder, 27 (51.9%) are using woodfire. In Control 27 (51.9%) using cylinder, and 20 (38.5%) using woodfire. It interpreted that majority (51.9%) were using wood fire and cylinder respectively. According to haemoglobin level, 28 (53.8%) were level of 7-7.9mg, In Control 13 (25.0%) were level of 6-6.9 mg, 18 (34.6%) were level of 7-7.9mg, 13 (25.0%) were level of 8-8.9mg and 8 (15.4%) were >/9mg. It interpreted that majority (53.8%) were the level of 7-7.9 mg.

**Table 1. Association between risk factors and demographic variables**

| Demographic variables | TB Contact | TB Contact year | BCG scar | unpasteurized milk | nutritional assessment |
|---|---|---|---|---|---|
| Age in years | 0.0430 | 0.4880 | 0.3540 | 0.0700 | 0.0770 |
| Gender | 0.0090 | 0.1420 | 1.0000 | 0.7270 | 0.0120 |
| Religion | 0.0550 | 0.2240 | 0.7430 | 0.7990 | 0.1780 |
| Residence | 0.5010 | 0.0550 | 0.0930 | 0.0270 | 0.5000 |
| Child Educational Status | 0.1700 | 0.8050 | 0.4090 | 0.2180 | 0.0060 |
| Mothers Educational Status | 0.0020 | 0.0070 | 0.2600 | 0.3720 | 0.0000 |
| Fathers Educational Status | 0.0030 | 0.1340 | 0.7000 | 0.0750 | 0.4210 |
| Mothers Occupation | 0.0030 | 0.0220 | 0.7220 | 0.7480 | 0.2670 |
| Fathers Occupation | 0.2290 | 0.3410 | 0.0070 | 0.4040 | 0.3890 |
| Family Size | 0.0990 | 0.7090 | 0.1380 | 0.1210 | 0.6720 |
| Kitchen Position | 0.1720 | 0.3310 | 0.1460 | 0.0030 | 0.3540 |
| Smoke Outlet Facility | 0.4610 | 0.3360 | 0.5060 | 0.3060 | 0.0300 |
| Bed Room Category | 0.0860 | 0.3160 | 0.7360 | 0.0970 | 0.9000 |
| No. of Family members | 0.0190 | 0.1140 | 0.2170 | 0.0520 | 0.0130 |
| Presence of Ventilation | 0.1830 | 0.1710 | 0.8210 | 0.0000 | 0.0020 |
| Bad habits | 0.0030 | 0.0220 | 0.5550 | 0.0020 | 0.0170 |
| Hand Washing | 0.1720 | 0.0010 | 0.1490 | 0.0000 | 0.0230 |
| Toilet facility | 0.3090 | 0.6210 | 0.9300 | 0.0050 | 0.0040 |
| Regular Brushing | 0.0730 | 0.9850 | 0.1940 | 0.2800 | 0.6130 |
| Bathing | 0.0200 | 0.0240 | 0.6830 | 0.2360 | 0.1770 |
| Play Activity | *0.0770* | 0.6980 | 0.0530 | 0.1190 | 0.8170 |
| Pet animals | 0.0030 | 0.0010 | 0.3660 | 0.0030 | 0.0070 |
| Environmental sanitation | 0.8750 | 0.3610 | 0.7750 | 0.6600 | 0.7020 |
| Water facility | 0.9670 | 0.5390 | 0.4410 | 0.0480 | 0.0480 |

**Table 1** Association of risk factors on childhood TB contact and contact years, BCG scar, un-pasteurized milk, nutritional status, the following demographic variables such as age, gender, child, mother and father educational status, mother occupation, no. of family members, Bad habits of parents, child bathing habit, pet animals, hand washing technique, presence of ventilation, toilet facility and water facility were significant. Hence it was interpreted that these all are the risk factors influenced childhood tuberculosis among children.

**Table 2. Association between risk factors and demographic variables.**

| Demo variables | worm infestation | asthma history | breast feeding | any chronic disease | smoking history | no. of cigarettes |
|---|---|---|---|---|---|---|
| Age in years | 0.0000 | 0.9770 | 0.0860 | 0.3090 | 0.2790 | 0.2920 |
| Gender | 0.5540 | 0.6470 | 0.4120 | 0.6470 | 0.3870 | 0.3350 |
| Religion | 0.0830 | 0.6010 | 0.3540 | 0.6010 | 0.0170 | 0.0020 |
| Residence | 0.2760 | 0.1620 | 0.6920 | 0.5710 | 0.2390 | 0.0260 |
| Child Educational Status | 0.0000 | 0.6610 | 0.1140 | 0.1170 | 0.0500 | 0.0060 |
| Mothers Educational Status | 0.0850 | 0.4310 | 0.2830 | 0.6950 | 0.0000 | 0.0000 |
| Fathers Educational Status | 0.0000 | 0.0390 | 0.0500 | 0.1810 | 0.0050 | 0.0490 |
| Mothers Occupation | 0.7650 | 0.0000 | 0.1060 | 0.9180 | 0.0510 | 0.6340 |
| Fathers Occupation | 0.0790 | 0.4860 | 0.0160 | 0.2370 | 0.3790 | 0.1390 |
| Family Size | 0.7620 | 0.2210 | 0.0020 | 0.2210 | 0.8610 | 0.1210 |
| Kitchen Position | 0.1840 | 0.2010 | 0.9470 | 0.7580 | 0.0610 | 0.1360 |
| Smoke Outlet Facility | 0.0920 | 0.4190 | 0.9990 | 0.4550 | 0.1660 | 0.0040 |
| Bed Room Category | 0.3680 | 0.4030 | 0.0040 | 0.9000 | 0.0670 | 0.1170 |
| No. of Family members | 0.0000 | 0.0280 | 0.0080 | 0.9940 | 0.6090 | 0.0370 |
| Presence of Ventilation | 0.0170 | 0.0030 | 0.0670 | 0.7800 | 0.5240 | 0.0010 |
| Bad habits | 0.0000 | 0.0860 | 0.4070 | 0.3090 | 0.0000 | 0.0000 |
| Hand Washing | 0.0130 | 0.0110 | 0.1750 | 0.7040 | 0.2140 | 0.0000 |
| Toilet facility | 0.2970 | 0.4990 | 0.2150 | 0.4990 | 0.1330 | 0.1310 |
| Regular Brushing | 0.0000 | 0.1440 | 0.1600 | 0.5730 | 0.8690 | 0.9990 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bathing | 0.0640 | 0.0540 | 0.0150 | 0.6470 | 0.1940 | 0.0150 |
| Play Activity | 0.0000 | 0.3450 | 0.0310 | 0.3450 | 0.2330 | 0.6170 |
| Pet animals | 0.0000 | 0.2130 | 0.3120 | 0.7440 | 0.7070 | 0.3290 |
| Environmental sanitation | 0.1950 | 0.7480 | 0.5150 | 0.7480 | 0.3630 | 0.7320 |
| Water facility | 0.0870 | 0.0570 | 0.0180 | 0.3860 | 0.0720 | 0.4050 |

**Table 2**Association of risk factors on child worm infestation, history of asthma, breast feeding, history of parents smoking, no. of cigarettes per day, tobacco habit of parents with the following demographic variables such as age of the child, child and father educational status, no. of family members, presence of ventilation, Bad habits, hand washing, regular brushing, play activity, pet animals, mother occupation, family size, bed room category and Water facility were significant. Hence it was interpreted that these are all the risk factors were influenced childhood tuberculosis among children.

**Table 3. Association between risk factors and demographic variables**

| Demo variables | tobacco history | alcohol history | cooking technique | Hb level | sleeping pattern | previous hospitalization |
|---|---|---|---|---|---|---|
| Age in years | 0.4820 | 0.0340 | 0.0210 | 0.2820 | 0.3340 | 0.3790 |
| Gender | 0.3320 | 0.0200 | 0.3580 | 0.1500 | 1.0000 | 0.7800 |
| Religion | 0.8940 | 0.1830 | 0.0650 | 0.1090 | 0.8640 | 0.5710 |
| Residence | 0.0010 | 0.0580 | 0.3120 | 0.4940 | 0.0070 | 0.8720 |
| Child Educational Status | 0.1110 | 0.0060 | 0.0540 | 0.3610 | 0.5150 | 0.9350 |
| Mothers Educational Status | 0.0220 | 0.1380 | 0.1090 | 0.0050 | 0.1060 | 0.7870 |
| Fathers Educational Status | 0.2550 | 0.1080 | 0.0010 | 0.8460 | 0.0880 | 0.9930 |
| Mothers Occupation | 0.1630 | 0.2690 | 0.0110 | 0.2260 | 0.2410 | 0.3630 |
| Fathers Occupation | 0.2270 | 0.0470 | 0.0010 | 0.9900 | 0.1840 | 0.2510 |
| Family Size | 0.0430 | 0.7980 | 0.0110 | 0.7060 | 0.2990 | 0.2890 |
| Kitchen Position | 0.2590 | 0.3980 | 0.0230 | 0.4270 | 0.0450 | 0.0720 |
| Smoke Outlet Facility | 0.0100 | 0.0060 | 0.3070 | 0.4350 | 0.6410 | 0.5970 |
| Bed Room Category | 0.2190 | 0.0930 | 0.0310 | 0.2550 | 0.1230 | 0.2560 |
| No. of Family members | 0.0610 | 0.4010 | 0.0000 | 0.2630 | 0.0100 | 0.9820 |
| Presence of Ventilation | 0.0080 | 0.4870 | 0.1660 | 0.4370 | 0.0000 | 0.7640 |
| Bad habits | 0.0870 | 0.0000 | 0.0470 | 0.6820 | 0.0150 | 0.4330 |
| Hand Washing | 0.0000 | 0.4380 | 0.0190 | 0.7250 | 0.0000 | 0.2010 |
| Toilet facility | 0.0000 | 0.1390 | 0.0000 | 0.1580 | 0.0190 | 0.2170 |
| Regular Brushing | 0.3530 | 0.1060 | 0.3860 | 0.1420 | 0.3630 | 0.3030 |
| Bathing | 0.0000 | 0.4230 | 0.0030 | 0.4660 | 0.0010 | 0.0390 |
| Play Activity | 0.8980 | 0.3720 | 0.0280 | 0.5510 | 0.6610 | 0.3290 |
| Pet animals | 0.6660 | 0.2820 | 0.0040 | 0.9000 | 0.1780 | 0.9700 |
| Environmental sanitation | 0.9280 | 0.5750 | 0.0000 | 0.4630 | 0.8420 | 0.1480 |
| Water facility | 0.0220 | 0.4740 | 0.0610 | 0.7150 | 0.1050 | 0.1140 |

**Table 3**Association of risk factors on Alcohol history of parents, cooking technique, Hb level of child, sleeping pattern and previous hospitalization, the following demographic variables such as age of child, gender, child, mother and father educational status, father and mother occupation, smoke outlet facility , bed room category, presence of ventilation, toilet facility, bathing habit of child and bad habits of parents were significant. Hence it was interpreted that these all are the risk factors influenced childhood tuberculosis among children.

**Table 4. Multivariate logistic regression for childhood tuberculosis among case and control n=104**

| Risk factors | Or | 95% class interval for or | | Chi- square | P- value |
|---|---|---|---|---|---|
| | | Lower | Upper | | |
| **TB Contact** | | | | | |
| a) In the family | - | | | 2.785 | |
| b) Relatives/ Neighbors | 1.500 | 0.3730 | 6.0325 | | 0.568 |
| c) None | 2.022 | 0.8804 | 4.6427 | | 0.097 |
| **TB contact year** | | | | | |
| a) Less than 2 year | - | | | 2.564 | |

| | | | | | |
|---|---|---|---|---|---|
| b) More than 2-3 years | 0.6667 | 0.0566 | 7.8524 | | 0.747 |
| c) No contact | 1.8182 | 0.8258 | 4.0029 | | 0.137 |
| **BCG Scar** | | | | | |
| a) Present | - | | | 1.040 | |
| b) Absent | 0.3203 | 0.0322 | 3.1845 | | 0.3312 |
| **Unpasteurized milk** | | | | | |
| a) Given | - | | | 1.095 | |
| b) Not given | 0.469 | 0.1109 | 1.9874 | | 0.304 |
| **Nutritional assessment** | | | | | |
| I St. degree malnutrition | - | | | 7.328 | |
| II Nd. degree malnutrition | 1.0526 | 0.38376 | 2.8879 | | 0.921 |
| III rd. degree malnutrition | 3.3333 | 1.0983 | 10.1164 | | ***0.0335** |
| severe malnutrition | 0.7407 | 0.1969 | 2.7866 | | 0.657 |

*** p value <0.05 – significant and < 0.001** highly significant.**

Indicates that in case nutritional status is have 3.33 times more risk than compare to controls. While the III rd. degree malnutrition has been increasing.

**Table 5. Multivariate logistic regression for childhood tuberculosis among case and control**

| Risk factors | Or | 95% class interval for or | | Chi- square | P- value |
|---|---|---|---|---|---|
| | | Lower | Upper | | |
| **worm infestation** | | | | | |
| a) Taken regularly | - | | | 0.349 | |
| b) Not taken | **1.2626** | **0.5825** | **2.7371** | | **0.555** |
| **Asthma History** | | | | | |
| a) Yes | - | | | 1.891 | |
| b) No | **0.2353** | **0.0254** | **2.1806** | | **0.203** |
| **Breast feeding** | | | | | |
| a) Up to 6 months | - | | | 3.324 | |
| b) Up to 1 year | **0.4714** | **0.1117** | **1.9899** | | **0.306** |
| c) Up to 2-3 yrs. | **0.2707** | **0.0584** | **1.2544** | | **0.095** |
| **Any other chronic disease** | | | | | |
| a) Yes | - | | | 1.891 | |
| b) No | **0.2353** | **0.0254** | **2.1806** | | **0.203** |
| **Smoking History** | | | | | |
| a) Yes | **1.0000** | **0.4281** | 2.3360 | 0.000 | **1.000** |
| b) No | | | | | |
| **No. of cigarettes** | | | | | |
| a) 10-8 | - | | | 3.974 | |
| b) 7-5 | **5.3200** | **0.2443** | **115.8695** | | **0.287** |
| c) 4-1 | **7.000** | **0.3056** | **160.3309** | | **0.223** |
| d) 0 | **8.3770** | **0.4162** | **168.5944** | | **0.165** |

*** p value <0.05 – significant and < 0.001** highly significant** Indicates that there is no significant in all variables

**Table 6. Multivariate logistic regression for childhood tuberculosis among case and control**

| Risk factors | Or | 95% class interval for or | | Chi- square | P- value |
|---|---|---|---|---|---|
| | | Lower | Upper | | |
| **Tobacco history** | | | | | |
| a) Per day 2 times | - | | | 1.606 | |
| b) Per day 4 times | 0.6000 | 0.0903 | 3.9857 | | 0.597 |
| c) Per day 6 times | 0.3333 | 0.0110 | 10.1078 | | 0.528 |
| d) No habit of tobacco | 1.0732 | 0.2894 | 3.9797 | | 0.915 |
| **Alcohol history** | | | | | |
| a) Yes | - | | | 0.044 | |
| b) No | 1.0929 | 0.4784 | 2.2967 | | 0.833 |
| **Cooking technique** | | | | | |
| a) Cylinder | - | | | 2.053 | |
| b) Kerosene | 0.7364 | 0.1582 | 3.4283 | | 0.696 |
| c) Woodfire | 1.6568 | 0.7393 | 3.7132 | | 0.220 |
| **Hb level of Child** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| a) 6- 6.9 mg | - | | | 5.539 | |
| b) 7-7.9 mg | 3.3704 | 1.0842 | 10.4774 | | ***0.036** |
| c) 8-8.9 mg | 1.5000 | 0.4139 | 5.4366 | | 0.537 |
| d) >/9 mg | 2.4375 | 0.6272 | 9.4733 | | 0.198 |
| **Sleeping pattern** | | | | | |
| c) Yes | - | | | 2.039 | |
| d) No | 5.1980 | 0.2435 | 110.9604 | | 0.291 |
| **Hospitalization** | | | | | |
| a) Yes | - | | | 0.078 | |
| b) No | 1.1688 | 0.3905 | 3.4981 | | 0.780 |

Indicates that case is have 3.37 times more risk than compare to controls. While the Hb level has been decreasing.

**DISCUSSION**

The first objective of the present study was to assess the risk factors of childhood tuberculosis among children with tuberculosis.

The study reveals that majority of the children at the age group of 1-5 yrs. in case and 1-5 yrs. and 11-14 yrs. in control group, in both group majority 45 (86.5%), 46 (88.5%) were Hindu, in both group case and control 49 (94.2%) were rural, in each group, Case and control 22 (42.3%) 27 (51.9%) were under kinder garden, in Case 21 (40.4%) were high school, In Control 15 (28.8%) were studied primary education and higher secondary, in present study in Case 18 (34.6%), in Control also 21 (40.4%) were high school.

The Study shows that in Case 42 (80.8%), in Control 43 (82.7%) were Home maker, in Case 26 (50.0%), in Control 28 (53.8%) were farmer, Both the group Case and control 40 (76.9%), 29 (55.8%) were cooking house itself, Smoke outlet present in each case and control 45 (86.5%), 49 (94.2%), in Case and Control 34 (65.4%) having single bedroom, 23 (44.2%) were 4 members in the family in case, and 23 (44.2%) more than 4 members in their family in control group, in Case 48 (92.3%) and in control 47 (90.4) having two windows in their homes [7].

In both the group 25 (48.1%) ,23 (44%) were no bad habits practices, in both case and control the majority (100%) were having the dietary habits of both vegetarian and non-vegetarian, in Case 45 (86.5%), in Control 44 (84.6%) wash their hands every 4 hours once regularly, in both the group Case and control 36 (69.2%), 40 (76.9%) were having the toilet facility, each group Case and control 36 (69.2%), 38 (73.1%) are having the habit of regular brushing, in each group Case 51 (98.1%) regular bath and In Control 9 (94.2%) take bath regularly.

In Case 36 (69.2%) and in Control 38 (73.1%) play in road, in Case 24 (46.2%) and in control group 31 (59.6%) were having pets, 51 (98.1%) of the environments are clean in case and control 47 (90.4%) majority were using municipality water, in case and Control both are getting adequate health information from the health personnel available to near them like PHC, Sub-centre and CHC.

The present study was correlated with Ayse mete yesil et al. (2020) conducted Diagnosis to treatment of paediatric Tuberculosis. A retrospective descriptive study was undertaken of 93 children aged 0-18 years in paediatric pulmonology department. Review of hospital records was performed for all children diagnosed as having TB. The result revealed that pulmonary TB was detected in 51.6%of the patients. Extrapulmonary involvement in 33.3% and pulmonary TB with extrapulmonary involvement in 15.1%. thus, they concluded that to prevent childhood TB is to fight adult diseases through early diagnosis and effective treatment [8].

The present study was supported by Thomas et all (2020) conducted denying predictors of loss to follow-up among people with tuberculosis in Puducherry and Tamilnadu, in controlling the spread of TB. case–control study among male TB patients. Out Of 425 clients with TB, 82 (19%) were LTFU. In the adjusted analyses of males, divorced/separated marital status (adjusted odds ratio [aOR] 3.80; 95% CI: 1.39–10.38) and at-risk alcohol use (aOR 1.92; 95% CI: 1.12–3.27) were significant predictors for increased risk of LTFU, and diabetes was a significant predictor for decreased risk of LTFU (aOR 0.52; 95%nCI: 0.29–0.92). the researcher concluded that of 53 men with recorded date of last treatment visit, 23 (43%) and 43 (81%) had LTFU within the first 2 and first 4 months of treatment.

Majority of the children 31 (59.6%) were no contact with the TB cases, In Both the group 30 (57.7%) are no contact with the TB patients compared to Control, In Case and control 51 (98.1%) presence of scar, Study revealed that 49 (94.2%) are not given unpasteurized milk. In this study 20 (38.5%) cases were under III rd. degree malnutrition, 30 (57.7%) not taken worms treatment regularly, 51 (98.1%) were absence of asthma history in home, 33 (63.5%) were given breast feeding up to 1 year, 51 (98.1%) of the children did not have any chronic diseases, 37 (71.2%), parents/ grandparents were no habit of smoking, 44 (84.6%) parents/ grandparents did not have tobacco habit.

In this study 36 (69.2%) parents were no habit of taking alcohol taking, (51.9%) are using woodfire and in Control 27 (51.9%) using cylinder, 28 (53.8%) of the children were 7-7.9mg of haemoglobin level, 52 (100.0%) were normal sleeping pattern, 45 (86.5%) in control group were no previous hospitalization [9].

The present study correlate with Ezra Shimeles et al (2019) about risk factors for tuberculosis, Total of 260 cases and 260 controls were enrolled in the study, Patients who live in house with no window or one window were almost two times more likely to develop tuberculosis compared to people whose house has multiple windows (AOR = 1.81; 95% CI:1.06, 3.07). Having a household member who had TB was shown to increase risk of developing TB by three-fold (AOR = 3.00; 95% CI: 1.60, 5.62). The study showed that illiterate TB patients were found to be more than twice more likely to develop TB compared to subjects who can at least read and write (AOR, 95% CI = 2.15, 1.05, 4.40). The Researcher shows the results of TB control effort need a strategy to address socio economic issues such as poverty, overcrowding, smoking, and infection control at health care facilities level is an important intervention to prevent transmission of TB within the facilities [10].

The present study supported by Hilary et al (2016) conducted a case control study on risk factors for tuberculosis in older children, to identify risk factors for tuberculosis in children aged 7 to 19. A case control study matched by age with 169 cases and 477 controls, used to identify risk factors. They concluded that Cigarette smoking increased by 50% the risk of tuberculosis but that this was not statistically significant (OR = 1.6). Other risk factors were sleeping in the same house as a case of tuberculosis (OR = 31.6), living in a house with no piped water (OR = 7.7) (probably as a proxy for bad living conditions), illiteracy (OR = 3.7) and male sex (OR = 1.8). The increase in risk with living in houses with no piped water was much more marked in males. Thus, concluded that Household contact with tuberculosis, social factors and male sex play the biggest role in determining risk of TB disease among children and adolescents in the study [11]**.**

**IN ODDs RATIO**

The odds ratio value found for the risk factors among the case and control were TB contact with relatives/ neighbours (OR=1.5), no contact with TB cases (OR= 2.0), TB contact more than 2-3 years(OR=0.6), no contact with cases (OR=1.8), presence of BCG scar (OR=0.3), taking of unpasteurized milk (OR=0.4), II nd. Degree malnutrition (OR= 1.0), III st degree malnutrition (OR=3.3), severe malnutrition (OR=0.7), Worms treatment (OR=1.2), absent of asthma history (OR=0.2), up to 1 year breast feeding (OR=0.4), UP TO 2-3 years (OR=0.2), any other chronic disease (OR=0.2), smoking history (OR=1.0), No. of cigarettes 7-5 (OR=5.3), 4-1(OR=7.0), 0 (OR=8.3), per 4 times tobacco history (OR=0.6), per day 6 times (OR=0.3), no habit of tobacco (OR=1.0), Habit of Alcohol history (OR=1.0), cooking technique by using kerosene (OR=0.7), by using cylinder (OR=1.6), Hb level of child 7-7.9 (OR=3.3), 8-8.9 (OR=1.5), >/9 mg (OR=2.4), sleeping pattern (OR=5.1), Previous hospitalization (OR=1.1).

## CONCLUSION

The purpose of this study was to assess the risk factors of childhood tuberculosis among children (1-14 yrs.) in selected hospital, cuddalore. The data revealed that the regular contact with the TB contact cases, nutritional status and low Hb level will be the major risk factors for the children to get the Tuberculosis. The ODDs ratio value found for the risk factors among cases and control.

## CONFLICT OF INTEREST

No conflict of interest.

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