



Association of Baseline Characteristics with RCBG among School Going Children (10-12 Yrs)

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ABSTRACT

There is a growing risk of non-communicable diseases among children aged 5 to 9 years and adolescents aged 10–19 years in India, One in ten school-age children and adolescents were pre-diabetic and One percent of school-age children and adolescents were diabetic (CNNS,2019). “Today children are future leaders” the researcher started the study to save the children life. Objective of the study is to know the Association of Baseline Characteristics with RCBG among School Going Children. A community based study was designed to assess the prevalence of diabetes and prediabetes among 953 school going children (10-12 years) boys and girls from four village Panchayath in Athoor Block of Dindigul district. Purposive Random Sampling was adapted for selection of respondents. Institutional Ethical Clearance was obtained before data collection. Demographic profile, were done through Interview Schedule, and biochemical assessment: Random Capillary Blood Glucose (RCG) was measured by Blood Glucose Monitor. Descriptive statistics were used to summarize the data. It is a part of research work. Majority 96.5% of the respondents were non-diabetic and 3.5% of the respondents were prediabetic. Hundred per cent of the boys were prediabetic. There was significant association and positive correlation between gender and RCBG Level of the respondents so rejecting the null hypothesis. There was significant association between RCBG and educational status of parents, occupational status of the parents, family income, and type of family of the respondents so rejecting the null hypothesis. There was no significant association between RCBG and grade, size of family of the respondents so accepting the null hypothesis. There was a positive correlation between RCBG and occupational status of mother, size of the family. There was a negative correlation between RCBG and educational status of the parents, family income, caste group and family type. There was a no correlation between RCBG and occupational status of the father, family income, caste group and family type. Some of the working mothers are not taking care of children properly, their children were buying and eating junk foods and not doing physical activity regularly that is also one of the reason for prediabetes. Household nutritional intervention is must to prevent Diabetes and Prediabetes.

Keywords: Diabetic, Pre-Diabetic, School Going Adolescents, Random Capillary Blood Glucose (RCBG)

INTRODUCTION

The World Health Organization (WHO) reported that the incidence rate of diabetes was more than 200 million people worldwide, which might exceed 400 million by 2030 (Zhao et al, 2020)

The epidemic of diabetes is one of the major concerns for public health globally, and it is projected that 700 million adults aged 20-79 (10.9% of the population) will have diabetes by 2045. There is a growing risk of non-communicable diseases among children aged 5 to 9 years and adolescents aged 10–19 years in India, One in ten

school-age children and adolescents were pre-diabetic and One percent of school-age children and adolescents were diabetic (CNNS,2019).

Objective of the study is to know the Association of Baseline Characteristics with RCBG among School Going Adolescents

MATERIALS AND METHODS

A community based study was designed to assess the prevalence of diabetes and prediabetes among 953 school going children (10-12 years) boys and girls from four village Panchayath in Athoor Block of Dindigul district. Purposive Random Sampling was adapted for selection of respondents. Institutional Ethical Clearance was obtained before data collection. Based on the willingness of the parents/care takers the adolescents were included in the study. Individual written consent form was obtained from each parents or care takers before collection of data. Demographic profile, were done through Interview Schedule, and biochemical assessment: Random Capillary Blood Glucose (RCG) was measured by Blood Glucose Monitor. Descriptive statistics were used to summarize the data, with frequencies and percentages for categorical variables, Binary Logistic Regression were used to measure the association between an exposures and an outcome. IBM SPSS 23 version was used for statistical analysis. It is a part of research work.

RESULTS AND DISCUSSION

Table.1 shows the Association of Random Capillary Blood Glucose and Demographic profile of school going children respondents. Majority 96.5% of the respondents were non-diabetic and 3.5% of the respondents were prediabetic. Among them 44.4%, 34.1% and 21.5% of the respondents in the age of 12yrs, 10yrs and 11yrs were prediabetic. Followed by 44.3%, 34.0% and 21.6% of the respondents in the age of 12yrs, 10yrs and 11yrs were non-diabetic. There was no significant association and correlation between RCBG and age of the respondents.

Table 1

Association of RCBG and Demographic profile of school going children respondents

Variables	RCBG		Total No 953(100.0)
	Prediabetic No 33(3.5%)	Non-Diabetic No 920(96.5%)	
Age(Yrs)			
10	12(36.4)	313(34.0)	325(34.1)
11	6(18.2)	199(21.6)	205(21.5)
12	15(45.5)	408(44.3)	423(44.4)
Chi – Square For 0.05 level@2 df CV : 0.236; TV:5.991 Correlation: 0.003			
Gender			
Boys	33(100.0)	497(54.0)	530(55.6)
Girls	-	423(46.0)	423(44.4)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@1 df CV : 27.28; TV:3.841 p=0.000 Correlation: 0.169			
Grade			
6	12(36.4)	307(33.4)	319(33.5)
7	6(18.2)	217(23.6)	223(23.4)
8	15(45.5)	396(43.0)	411(43.1)
Chi – Square For 0.05 level@2 df CV : 0.526; TV:5.991p=0.769 Correlation: 0.001			

Table 4.37 presents the association of RCBG with demographic profile of school going adolescent respondents. Out of the 953 respondents, only 3.5% were regarded as prediabetic. Among them 44.4%, 34.1% and 21.5% of the respondents are in the age of 12 years, 10 years and 11 years, respectively. In the non-diabetic (920) respondents, 44.4%, 34.0% and 21.6% of the respondents are in the age of 12 years, 10 years and 11 years, respectively. No significant association and correlation was observed between RCBG and age of the respondents.

All the prediabetic respondents were boys and the p-value <0.05 shows there was significant association between RCBG and gender of the respondent at 5% level. Hence, it concludes that there was no significant association and correlation between RCBG and age of the respondents which accepts the null hypothesis. Meanwhile, a significant association and a positive correlation was observed between the gender and RCBG Level of the respondents, rejecting the null hypothesis.

In all races, higher BMI and parental diabetes were associated with higher risk of pre-diabetes and diabetes, while female sex was associated with lower risk of pre-diabetes¹.

Table 2

Association of RCBG and Socioeconomic Status of school going children respondents

Variables	RCBG		Total No 953(100.0)
	Prediabetic No 33(3.5%)	Non-Diabetic No 920(96.5%)	
Education Status Of The Father			
Illiterate	-	174(18.9)	174(18.3)
Primary	6(18.2)	165(17.9)	171(17.9)
Upper Primary	12(36.4)	338(36.7)	350(36.7)
Secondary	-	156(17.0)	156(16.4)
Higher Secondary	9(27.3)	45(4.9)	54(5.7)
Diploma/Graduate/Professional Degree	6(18.2)	42(4.6)	48(5.0)
Chi – Square For 0.05 level@5 df CV : 51.730; TV:11.070 p=0.000 Correlation: -0.147			
Education Status of The Mother			
Illiterate	-	159(17.3)	159 (16.7)
Primary	6(18.2)	123(13.4)	129(13.5)
Upper Primary	12(36.4)	320(34.8)	332(34.8)
Secondary	9(27.3)	201(21.8)	210(22.0)
Higher Secondary	-	87(9.5)	87(9.1)
Diploma, Graduate & Professional Degree	6(18.2)	30(3.3)	36(3.8)
Chi – Square For 0.05 level@5 df CV : 28.59; TV:11.070 p=0.000 Correlation: -0.085			
Occupation Status Of The Father			
Unemployed	3(9.1)	12(1.3)	15(1.6)
Wage earner	21(63.6)	602(65.4)	623(65.4)
Agriculture	-	81(8.8)	81(8.5)
Self-Employee	3(9.1)	132(14.3)	135(14.2)
Private Employee	6(18.2)	84(9.1)	90(9.4)
Government Employee	-	9(1.0)	9(0.9)
Chi – Square For 0.05 level@5 df CV : 18.90; TV:11.07p=0.002 Correlation: 0.006			

¹ Zamora-Kapoor, A., Fyfe-Johnson, A., Omidpanah, A., Buchwald, D., and Sinclair, K. (2018). Risk factors for pre-diabetes and diabetes in adolescence and their variability by race and ethnicity. *Preventive Medicine*, 115, 47–52. doi:10.1016/j.ypmed.2018.08.015

Occupation Status Of The Mother			
Home maker	21(63.6)	274(29.8)	295(31.0)
Wage earner	12(36.4)	484(52.6)	496(52.0)
Agriculture	-	30(3.3)	30(3.1)
Self-employee	-	51(5.5)	51(5.4)
Private employee	-	57(6.2)	57(6.0)
Government employee	-	24(2.6)	24(2.5)
Chi – Square For 0.05 level@5 df CV : 19.221; TV:11.07p=0.002 Correlation: 0.116			
Family Income			
Lower income(<5000)	18(54.5)	388(42.2)	406(42.6)
Middle income(5000-15000)	-	490(53.3)	490(51.4)
Upper income(>15000)	15(45.5)	42(4.6)	57(6.0)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@2 df CV : 107.029; TV:10.597p=0.000 Correlation: -0.087			
Caste Group			
BC	15(45.5)	485(52.7)	500(52.5)
MBC/OBC	6(18.2)	42(4.6)	48(5.0)
SC/ST	12(36.4)	393(42.7)	405(42.5)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@3 df CV : 169.40; TV:7.815p=0.000 Correlation: -0.069			
Type of family			
Nuclear	21(63.6)	701(76.2)	722(75.8)
Joint	12(36.4)	219(23.8)	231(24.2)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@1 df CV :2.736; TV:2.706p=0.105 Correlation: -0.054			
Size of Family			
≤4	21(63.6)	517(56.2)	538(56.5)
5-8	12(36.4)	403(43.8)	415(43.5)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@1 df CV :0.717 ; TV:3.841p=0.397 Correlation:0.027			
Type of House			
Concrete	21(63.6)	396(43.0)	417(43.8)
Detached	6(18.2)	359(39.0)	365(38.3)
Asbestos	6(18.2)	147(16.0)	153(16.1)
Hut/Tinsheet	-	18(2.0)	18(1.9)
Total	33(3.5)	920(96.5)	953(100.0)
Chi – Square For 0.05 level@4 df CV :7.442 ; TV:9.448p=0.114 Correlation: 0.051			

Table 4.38 shows the association of RCBG with socioeconomic status of school going adolescent respondents. Around 45.5% of the prediabetic and 43.0% of the non-diabetic respondents were studying 8th grade. Whereas, 36.4% of the prediabetic and 33.4% of the non-diabetic respondents were studying 6th grade. $P \geq 0.05$ indicates that there was no significant association and correlation between RCBG and grade of the respondents.

36.4% of the prediabetic and 36.7% of the non-diabetic respondent's father completed upper primary education, whereas, 27.3% of the prediabetic and 4.9% of the non-diabetic respondent's father completed higher secondary level education, followed by 18.2% of the prediabetic and 17.9% of the non-diabetic respondent's father with the completion of primary education and 18.2% of the prediabetic and 4.6% of the non-diabetic

respondent's father with a Diploma/Graduate/Professional Degree. P-value of this much less ($P \leq 0.05$) confirms that there was a significant association between RCBG and education status of the father at 5% level. Education status of the father had significant influence on RCBG level of the respondents with negative correlation.

Around 36.4% of the prediabetic and 34.8% of the non-diabetic respondent's mother had studied upper primary education, whereas 27.3% of the prediabetic and 21.8% of the non-diabetic respondent's mother completed secondary level education, followed by 18.2% of the prediabetic and 13.4% of the non-diabetic respondent's mother with primary level education and 18.2% of the prediabetic and 3.3% of the non-diabetic respondent's mother with Diploma/Graduate/Professional Degree. P-value (≤ 0.05) shows that there was significant association between RCBG and education status of the mother at 5% level. Education status of the mother was found to have a significant influence on RCBG level of the respondents with negative correlation.

Out of the respondents, 63.6% of the prediabetic and 65.4% of the non-diabetic respondent's father were wage earner, whereas, 18.2% of the prediabetic and 9.1% of the non-diabetic respondent's father were private employee, followed by 9.1% of the prediabetic and 14.3% of the non-diabetic respondent's father with self-employment and 9.1% of the prediabetic and 1.3% of the non-diabetic respondent's father were unemployed. $P \leq 0.05$ shows that there was significant association between RCBG and occupational status of the father at 5% level without any correlation between them.

Around 63.6% of the prediabetic and 29.8% of the non-diabetic respondent's mother were noted as home maker, whereas 36.4% of the prediabetic and 52.6% of the non-diabetic respondent's mother were found as wage earner. $P \leq 0.05$ confirms that there was a significant association between RCBG and occupational status of the mother at 5% level with a positive correlation.

Majority (54.5%) of the prediabetic and 42.2% of the non-diabetic respondents were belong to lower income (<5000) whereas, 45.5% of the prediabetic and 4.6% of the non-diabetic respondents belong to Upper income (>15000) category. $P \leq 0.05$ reveals that there was a significant association between RCBG and family income at 5% level with a negative correlation.

Around 45.5% of the prediabetic and 52.7% of the non-diabetic respondents were belongs to BC community, meanwhile, 36.4% of the prediabetic and 42.7% of the non-diabetic respondents were belong to SC/ST community, followed by 18.2% of the prediabetic and 4.6% of the non-diabetic respondents were belong to MBC/OBC community. P-value of less than 0.05 shows that there was a significant association between RCBG and family income at 5% level with a negative correlation.

More than half (63.6%) of the prediabetic and (76.2%) non-diabetic respondents were from nuclear family, whereas 36.4% of the prediabetic and 23.8% of the non-diabetic respondent were from joint family. P-value of ≥ 0.05 reveals that there was no significant association between RCBG and type of family at 5% level and the analysis also showed that there was a negative correlation between family type and RCBG Level of the respondents.

Around 63.6% of the prediabetic and 56.2% of the non-diabetic respondents were from small family with ≤ 4 family members, whereas 36.4% of the prediabetic and 43.8% of the non-diabetic respondent were from large family with 5-8 family members. P value of ≥ 0.05 concludes that there was no significant association between RCBG and size of the family at 5% level. There was a positive correlation between size of the family and RCBG Level of the respondents.

The results conclude that there was a significant association between RCBG and educational status of the parents, occupational status of the parents, family income, and type of family of the respondents which rejects the null hypothesis. Whereas, no significant association was observed between RCBG and educational grade, size of the family of the respondents which accepts the null hypothesis. A positive correlation was observed between RCBG and occupational status of the mother, size of the family. A negative correlation was observed between RCBG and educational status of the parents, family income, caste and family type. No correlation was observed between RCBG and occupational status of the father, family income, community and family type.

Childhood SES disadvantage predicted increased odds of prediabetes and diabetes net of age, gender, race, and smoking (OR=1.11, 95% CI: 1.01-1.22)².

CONCLUSION

Majority 96.5% of the respondents were non-diabetic and 3.5% of the respondents were prediabetic. There was significant association between RCBG and gender, educational status of parents, occupational status of the parents, family income, and type of family of the respondents so rejecting the null hypothesis. These factors are significantly influence the prediabetes. There was a positive correlation between RCBG and gender, occupational status of mother and size of the family. Some of the working mothers are not taking care of children properly, their children were buying and eating junk foods and not doing physical activity regularly that is also one of the reason for prediabetes. Household nutritional intervention is must to prevent Diabetes and Prediabetes.

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² Tsenkova,V., Pudrovskaya, T., and Karlamangla,A. (2014). Childhood Socioeconomic Disadvantage and Prediabetes and Diabetes in Later Life. *Psychosomatic Medicine*, 76(8), 622–628. doi:10.1097/PSY.0000000000000106