ISSN PRINT 2319-1775 Online 2320-7876, www.ijfans.org
Vol.11, Iss.7, Dec- 2022

UGC CARE Listed (Group -I) Journal

Research Paper

Nutritional Status of school going children in Nagpur city, Maharashtra, India.

.Pradnya Bagalkote[1] , Dr Manda Walokar[2]
1.Research Scholar, Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, Maharashtra, India
2.Research Scholar, Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, Maharashtra, India.

Abstract Aim-This study was performed to assess the nutritional status and to know dietary habits of school going children in Nagpur city, Maharashtra, Central India. Along with nutritional status also collected information regarding personal hygiene of students. **Sample Size** – The sample size that was used in the study was 264 respondents' (School going children 13-15yrs). **Sampling technique**- Structured questionnaire were prepared to collect information from the respondents. Purposive sampling technique were followed to gather information for this study. In this study total 264 participants were enrolled. N=120(45.5%) respondents were male and N=144 (54.5%) respondents were female. **Conclusion**- From the above information it was clearly shown that school going children were aware about balanced diet and its impact on health. Reported from the collected data that maximum 67.9% respondents had bowl of fruits and vegetables in their daily diet and minimum 32% respondents were rarely consumed fruits and vegetables in their daily diet. Crystal clear from the collected data that maximum respondents were lacking in daily intake of balanced diet in their daily life so many of them were found underweight. When asked regarding the daily consumption of balanced diet 49.2% minimum respondents said yes while maximum 50.8% said no regarding the daily consumption of balanced diet. Hence urban school going children were deficit in macronutrient and micronutrient intake. It was important to develop healthy eating habits in school going children.

Aims and Objectives

1.To assess the nutritional status of school going children.
2.To know dietary habits of school going children.
3.To know the personal hygiene of school going children.
4. To know the habits of cleanliness of school going children.

Introduction- This study was performed to assess the nutritional status and to know dietary habits of school going children in Nagpur city,Central India. Along with nutritional status we also collected information regarding personal hygiene of students. School-age children need healthy foods and nutritious snacks. They have a steady but slow rate of growth and usually eat 4 to 5 times a day (with snacks). Many food habits, likes, and dislikes are set during this time. Family, friends, and the media (chiefly TV) effect their food choices and eating habits. School-age children are often willing to eat a wider variety of foods than their younger siblings. Eating healthy after-school snacks is important, too, as these snacks may contribute up to one-fourth of the total calorie intake for the day. School-age children can also help with meal preparation. (https://www.stanfordchildrens.org/)

Thorat (2009) in his article explores the differing health status of lower caste social groups in India, analyses the reasons for the differences and discusses some of the implications for policy. National Family Planning and Health Survey (NFH-3) data shows that children belonging to lower castes have worse nutrition, health and mortality indicators and poorer access to health services and nutrition schemes than children from higher castes, even after other socioeconomic factors are considered.

Riaz *et al.,*(2010) worked on compare the nutritional status of school children studying in public and private schools. Cross sectional comparative study; carried out among public and private school children. Out of 7 public and 3 private schools, 230 and 114 students respectively were enrolled in the study for measuring their height and weight. Of the total 344 respondents, 24.1% and 10.8% students were found to be under weight and stunted respectively. Taking into consideration weight-for-age, stature-for-age and body mass index (BMI)-for-age of the study subjects, 162 students (47.1%) were found to be well nourished with 46.9% and 47.4% public and private school children respectively where as 52.9% of the

study population were found to have compromised nutritional status with reference to one or more of the parameters. Stunted growth was found in 12.8% males and 8.3% female students.

Shrivastava *et al.*,(2012) said malnutrition, the condition resulting from faulty nutrition, weakens the immune system and causes significant growth and cognitive delay. Growth assessment is the measurement that best defines the health and nutritional status of children, while also providing an indirect measurement of well-being for the entire population. A cross-sectional study, in which he explored nutritional status in school-age slum children and analyse factors associated with malnutrition with the help of a pre-designed and pre-tested questionnaire, anthropometric measurements and clinical examination from December 2010 to April 2011 in urban slums of Bareilly, Uttar-Pradesh (UP), India. The mean height and weight of boys and girls in the study group was lower than the CDC 2000 (Centers for Disease Control and Prevention) standards in all age groups. Regarding nutritional status, prevalence of stunting and underweight was highest in age group 11 yrs to 13 yrs whereas prevalence of wasting was highest in age group 5 yrs to 7 yrs. Except refractive errors all illnesses are more common among girls, but this gender difference is statistically significant only for anaemia and rickets..

Farhin *et al*.,(2021) counted the mean age of the sample was 9.38 ± 4.14 with the maximum number of children (49.1%) in the age bracket of 5-9. Out of 1710 children, 54.4% had normal weight for age, 25.3% were underweight, 7.5% overweight and 12.8% were found to be obese. Stunting was found to be 26%. Prevalence of being underweight was higher than overweight /obesity particularly in younger and higher age groups as indicated by p-value of 0.000. Comparing with females, male students had significantly higher frequency of being underweight and stunted as reflected by p-value of 0.004 and 0.000 respectively. Univariate analysis also showed a strong association between age and nutritional status as mean weight increased from 39.22 ±5.21 to 63.50± 4.66 and height from 35.67±5.76 to 113.73± 29.22 with advancing age. Undernutrition remains an ongoing health problem in school going children of rural Islamabad; particularly in male students of younger age groups. School health programs and nutritional interventions need to be strengthened particularly in rural areas of Islamabad.

Sarkar *et al*.,(2020)in his research of cross-sectional analysis of 80 school-going children who are village residents in various parts of Navaron, Jashore. A stratified random cluster sampling has been used in 5 schools to select 53 boys and 27 girls aged 10-18. The child received three meals per day in 90 percent of the cases, albeit inadequately. It was found that 56.25 % of the respondent drink water from deep tube well and 42.50 % from Tube well, 66.25 % take nutritional supplements and their type of supplement is vitamins/minerals (61.25 %), about 31.25% kids take fast foods few days a week and most of the children do not participate in physical activity, of about 81.25 %. They found kids from low-income and less-educated families had a dietary pattern which is poor in terms of balanced diet. These urban slum school children's diets were inadequate for macronutrients and micronutrients, which poses a threat to significant nutritional and health consequences. It was important to emphasize the need to develop healthy food supply and habits.

Ahsan *et al.,* (2020) assessed nutritional status as per Waterlow's classification. A value within ±2 SD in these charts were considered as normal. Statistical package, SPSS 20.0 was used for data analysis. Of the total 571 children, 348 (56.4%) were boys and 223 (43.6%) were girls. Nearly 89 (15.5%) children including 52 (10.5%) boys and 37(6.4%) girls had normal anthropometric indices. Stunting was the most frequent anthropometric failure (n=219, 38.3%) followed by wasting (n= 163, 28.51%) and underweight (n=100, 17.5%) respectively. Gender disparity was observed in the distribution of malnutrition with boys had higher frequency of stunting, wasting and underweight than girls. Frequency of malnutrition among school going children living in urban slums were found to be 38.3% (stunting), 28.5% (wasting) and 17.5% (underweight), accordingly to the standard laid by CDC 2000 standard. This study showed higher frequency of malnutrition in male gender.

Rani *et al.,* (2020) said that malnutrition results in weak immune system and growth and cognitive delay. A descriptive study was conducted to assess the nutritional status of school going children in the age group of 6 -13 years in a selected school of Delhi. A total of 211 children were selected through purposive sampling technique. Structured questionnaire and a record sheet were used to collect the data. Height, weight and Blood Pressure of children were measured by using inch-tape, weighing scale, sphygmomanometer respectively. Descriptive and inferential statistics were employed to interpret the data. Out of 211 school going children, 144 (66.2%) were in the age group 6 to 9 years and 67 (31.8%) were in the 10-13 years age group. In the age group of 6 to 9 years, 140 were underweight and 1 was overweight

and rest 3 had normal weight as per Basal Metabolic Index. In 10 to 13 years age group, 60 were underweight and 7 had normal weight. As per Waterlows's classification, all 211 children had normal weight for age. As per Gomez classification of children, in 6 -9 years age group, 52 and in 10-13 years age group 20 had normal nutritional status respectively whereas rest of the children fell in degree I and II malnutrition.

Methodology.

Sample Size – The sample size that was used in the study was N=264 respondents (School going children age between 13-15yrs).

Sampling technique- Structured questionnaire were prepared to collect information from the respondents. Purposive sampling technique were followed to gather information for this study. In this study N=120(45.5%) respondents were male and N=144 (54.5%) respondents were female.

Results and Discussion –

Table no 1 : Distribution of school children by demographic and anthropometry characteristics.

Characteristics (n=264)		
Gender	Male	120(45.5)
	Female	144(54.5)
Age(in years)	13-14	104(39.4)
	14-15	104(39.4)
	15 -16	56(21.2)
Height	Stunted	74(28)
	Normal	190(78.8)
BMI and weight	Underweight	106(40.2)
	Normal	112(42.4)
	Overweight	26(9.8)
	Obese	20(4.5)

(Numbers in parenthesis indicate per cent cases)

Mouzan *et al.*, (2010) reported the objective of his study was to establish the prevalence data. The prevalence of nutritional indicators in the form of underweight, stunting, and wasting in a national sample of children younger than 5 years of age was calculated using the new WHO standards as reference. The prevalence of moderate and severe underweight, wasting and stunting, was defined as the proportion of children whose weight for age, weight for height, and height for age were below -2 and -3 standard deviation scores, respectively. The number of children younger than 5 years of age was 15 516 and 50.5% were boys. The prevalence of moderate and severe underweight was 6.9% and 1.3%, respectively. The prevalence of moderate and severe wasting was 9.8% and 2.9%, respectively. Finally, the prevalence of moderate and severe stunting was 10.9% and 2.8%, respectively. The prevalence was lower in girls for all indicators. Comparison of the prevalence of nutritional indicators in selected countries demonstrates large disparity with an intermediate position for Saudi Arabia.This report establishes the national prevalence of malnutrition among Saudi children. Compared to data from other countries, these prevalence rates are still higher than other countries with less economic resources, indicating that more efforts are needed to improve the nutritional status of children.

Patel *et al.*,(2015) stated that concerned and co-ordinated health education measures should be included through different programs to improve the personal hygiene, poor sanitary practices and to provide nutritional supplements to school children during periods of poor food intake which may benefit children and help to prevent acute under nutrition. Mohamad *et al.*,(2021)said that malnutrition is an underlying factor in many diseases in both children and adults, and it contributes greatly to the disability-adjusted life years worldwide. It is a major public health concern in developing countries among children since it places a heavy burden on already disadvantaged communities.

1. 1.From the above table it was found that N=120(45.5%) respondents were male and N=144 (54.5%)respondetns were female.
2. ICMR 2009,the mean weight and height of the children according to age and sex were compared with the median weight for age and height for age as per Indian Council of Medical Research (ICMR)

standards. In the age category 104 (39.4%) respondents belongs to the age group of 13-14 years and 14-15 years respectively while N=56 (21.2%) belongs to the category of 15-16 years of age.

3. 3.74(28%) respondents reported height between stunted height i.e. 4feet to 5feet,134(50.8%) were found to be in the normal category of 5feet to 5.5".N=46(17.4%) reported their height 5.6" to 6 feet and 3.8% were fall under the category of 6 feet.
4. Donnell *et al.,*(2008) said that stunting represents chronic nutritional inadequacy and/or frequent or chronic disease rather than short-term changes in nutritional status. WHO has recommended BMI for age as the best indicator for use in children and adolescents.

In the weight category 42.2% respondents reported their weight below 40kg and 42.4% reported under the normal category of 41-50kg.9.8% respondents belong to the category of 51-60kg and 4.5% respondents fall under the category of 61-70kg.

Table 2: Daily Dietary Practices

N=264	Yes	No
Daily Breakfast	194(73)	70(26.9)
Daily Consumption of fruits and vegetables	178(67.9)	86(32)
Daily Consumption of fast foods	220(82.9)	44(17.1)
Daily Consumption of cold drinks and beverages	252(95.4)	12(4.6)
Daily Consumption of green leafy vegetables	192(72.1)	72(27.9)
Daily Consumption of non vegetarian food	208(78.5)	56(21.5)
Daily Consumption of honey	215(62.3)	49(37.7)
Daily Consumption of tea/coffee	112(42.7)	152(57.3)
Daily Consumption of milk	188(71.1)	76(29)
Daily Consumption of jawar/bajra	120(45.8)	144(54.2)
Daily Consumption of sweets	48(17.6)	216(82.4)
Daily Consumption of balanced diet	128(49.2)	136(50.8)
Daily Consumption of sprouts	192(72.1)	72(27.9)
Water intake more than 1 litre	60(22.9)	204(77.1)
Daily Consumption of salad	124(46.2)	140(53.8)

(Numbers in parenthesis indicate per cent cases)

Reddy *et al.,* (2018) stated that orphan's children are vulnerable and neglected group in the society and are more prone to malnutrition. Aim is to assess the nutritional status, personal hygiene and demographic details of the children living in different orphanages in Bhubaneswar city. Pearson Chi-Square test was used to determine the association between personal hygiene and nutritional status. Out of 210 children, majority 57.7% were malnourished, 53.3% were stunted and malnutrition was higher among the boys than girls whereas the personal hygiene practices scores were better in girls than boys. Our study revealed a significant association between nutritional status and poor personal hygiene ($p<0.05$).

Tiwari *et al.,(2022)* stated that child malnutrition continues to exist as a major public health concern worldwide mainly in most of the low- and middle-income countries such as India. The screening of the school children is an effective tool to quantify the current prevalence in the country.The prevalence of undernutrition (stunting) in both the study areas is 20.8% (24% in rural and 21.7% in urban). In body mass index analysis, 15.77% were thin, 6.25% were severely thin and only 2.38% were overweight in rural area while 14.24% were thin, 7.8% were severely thin and 11.9% were overweight in the urban area schools.

Meshram *et al.,* (2018) stated that children residing in urban slum area are the most vulnerable. Poverty, illiteracy, neglect of health, low socioeconomic status and non-affordability of quality health care services make them more vulnerable to malnutrition. 361 school going children residing in urban slum area were included in study. Socio-demographic details of the children taken from their parents. Health check-up was done. Prevalence of malnutrition was 40.17%. 17.17% children were underweight and 22.99% were stunted.

Bhattacharya *et al.,(2020)* stated that poor nutritional status in primary school children can lead to several health problems such as easy susceptibility to common childhood diseases. Personal hygiene status is an important predictor of nutritional status and morbidity in children as water- and sanitation-related diseases are the leading causes of early morbidity and mortality in children. The present study was a cross-sectional study conducted in selected urban and rural areas of Shillong in children 6–12 years of age. The total sample size calculated was 510. Height, weight, and BMI were taken for all the children following the standard procedures. WHO growth standards were used for grading of nutritional status. The overall prevalence of underweight in the children of 6–9 years was 74 (18.7%) and that of stunting was 68 (17.2%). The overall prevalence of thinness and stunting in children aged 10–12 was 38 (19.1%) and 46 (23.2%). The prevalence of nutritional deficiency syndromes was 192 (32.4%). The primary school going children in Shillong had poor nutritional status.

5.Shivprakash *et al*(2014)reported that approximately 20–50% of elementary-school-children currently suffer nutritional deficiencies. Out of 264 respondents 26.9% replied that they were not taking any breakfast.49.2% respondents said that they were taking only milk in their breakfast. Only 6.9% respondents consumed sproutes in their breakfast while 16.9% respondents said that they were only taking fruits in the breakfast.

6. Crystal clear from the collected data that maximum 67.9% respondents had bowl of fruits and vegetables in their daily diet and minimum 32% respondents were rarely or not consumed fruits and vegetables in their daily diet.

7. Aheto *et al*.,(2015) said that proper interventional strategies and policies may improve the nutritional status of children and also improve their health status by identifying risk factors associated with health.

Out of 264 respondents 34.9% said that they were consumed the fast food once in a while,43.4% respondents were consumed the fast food once in a week.6.7% respondents daily used to consumed the fast food and 17.1% said that they were not taking any fast food in their daily routine.

8.It has been observed from the data 78.6% subjects said that they were taking cold drinks sometimes while 16.8% had cold drinks once in a week.4.6% subjects said that they didn't consumed cold drinks and beverages on daily basis.

10.It has been observed from the data 52.8% respondents daily consumed green leafy vegetables and 27.9% respondents said that they didn't consumed green leafy vegetables.16.3% said that they were eating green leafy vegetables twice in a day.

11. Out of 264 respondents 3.1% said that they were daily taking non vegetarian foods as well as 36.9% said that they were taking non vegetarian foods once in a week.38.5% used to consumed non vegetarian foods occassinally while 21.5 % fall under the category of purely vegetarian.

12.When asked consumption of honey in their daily diet only 6.1% responded positively while 56.2% replied negatively for the same.37.7% said that they were not consuming honey.

13. It has been observed from the data 42.7% respondents said yes for daily consumption of tea and coffee while 57.3%% respondents said no for daily consumption of tea and coffee.

14.71.1% respondents said yes for the daily consumption of milk in their daily diet while 29% respondents said no for the daily consumption of milk in their daily diet.

15.When asked about consumption of millets in daily diet of subjects 45.8% replied positively while 54.2% replied negatively for the consumption of millets.

16. It has been observed from the data 17.6% respondents said yes for daily consumption of sweets while 82.4% respondents said no for daily consumption of sweets in their daily diet.

17. Masibo *et al*.,(2009)reported that despite socioeconomic development, childhood malnutrition remains a health issue in developing countries.

When asked regarding the daily consumption of balanced diet 49.2% respondents said yes while 50.8% said no regarding the daily consumption of balanced diet.

18.Maximum number of subjets 72.1% said that they consumed sprouts on daily basis ,while 27.9% said that they consumed sprouts once in a month not in daily diet.

19. When asked regarding the daily intake of water more than 1 litre only 22.9% responded positively for the same while 77.1% responded negatively for daily water intake more than 1 litre per day.

20. Reema *et al*.,(2017) reported that diets of children contain more of calorie rich processed food and less of fruits, vegetables and animal foods. This usually leads to a deficiency of micronutrients.

Maximum respondents 53.8% said that they were not eating salad on daily basis and 46.2% said that they were eating salad on daily basis.

Summary and Conclusion

This study was performed to assess the nutritional status and to know dietary habits of school going children in Nagpur city, Maharashtra, Central India. Along with nutritional status also collected information regarding personal hygiene of students. The sample size that was used in the study was 264 respondents' (School going children 13-15yrs). N=120(45.5%) respondents were male and N=144 (54.5%) respondents were female. **Conclusion**- From the above information it was clearly shown that school going children were aware about balanced diet and its impact on health. Reported from the collected data that maximum 67.9% respondents had bowl of fruits and vegetables in their daily diet and minimum 32% respondents were rarely consumed fruits and vegetables in their daily diet. Crystal clear from the collected data that maximum respondents were lacking in daily intake of balanced diet in their daily life so many of them were found underweight. When asked regarding the daily consumption of balanced diet 49.2% minimum respondents said yes while maximum 50.8% said no regarding the daily consumption of balanced diet. Hence urban school going children were deficit in macronutrient and micronutrient intake. It was important to develop healthy eating habits in school going children.

References

1. 1.Farhin, S., Jaffry, T.N., Zafar, S., & Rashid, F.J. (2021). Frequency and assessment of Nutritional Status of school going children in rural areas of Islamabad. *Pakistan Journal of Medical Sciences*, *37*, 1475 - 1479.
2. 2.Srivastava, A., Mahmood, S.E., Srivastava, P., Shrotriya, V.P., & Kumar, B. (2012). Nutritional status of school-age children - A scenario of urban slums in India. *Archives of Public Health*, *70*, 8 - 8.
3. 3.Riaz, R., Sultana, A., Hameed, S., Tehseen, I., & Sabir, S.A. (2010). Nutritional Status of School Going Children.
4. 4.Sarkar, A., Arafat, Y., Alam, M., & Sarkar, J.K. (2020). Study on Dietary Pattern and Nutritional Status of School Going Children in Navaron, Jashore, Bangladesh. *American Journal of Food Science and Technology*, *8*, 70-74.
5. 5.Ahsan, S., Saleh, Z.M., Sheikh, S.A., Fahim, M., Memon, M.S., & Shakil, S. (2020). Nutritional Status of School Going Children of 5-15 Years of Age:Urban Slums Scenario in Karachi, Pakistan.
6. 6.Rani, S. (2020). A Descriptive Study to Assess the Nutritional Status of School Going Children in A Selected School of Delhi. *Indian Journal of Youth and Adolescent Health*, *07*, 1-4.
7. 7.https://www.stanfordchildrens.org/en/topic/default?id=school-aged-child-nutrition-90-P02280
8. 8.Thorat, S., & Sadana, N. (2009). Discrimination and Children's Nutritional Status in India. *IDS Bulletin*, *40*, 25-29.
9. 9.Reddy, S.B., Jyothula, N., Kandula, I., & Chintada, G.S. (2018). Nutritional status and personal hygiene of children living in the orphanages of Bhubaneswar: capital city of Odisha. *International Journal Of Community Medicine And Public Health*.
10. 10.El Mouzan, M.I., Foster, P.J., Al Herbish, A.S., Al Salloum, A.A., Al Omar, A.A., & Qurachi, M.M. (2010). Prevalence of malnutrition in Saudi children: a community-based study. *Annals of Saudi Medicine*, *30*, 381 - 385.
11. 11.Mohamed, H.T., Alanazi, F., Alanazi, S.F., Aljuraysi, M.N., & Alanazi, O.A. (2021). Malnutrition and Some Related Factors in Primary School Children in Saudi Arabia: Systemic Review. *Journal of Pharmaceutical Research International*.
12. 12.Tiwari, M., Nathani, N., & Dubey, G.P. (2022). Malnutrition: Prevalence and risk factors – A cross-sectional study among school going children in Varanasi, the Ancient City of India. *AYUHOM*, *9*, 77 - 83.
13. Meshram, T.T., & Khobragade, A.W. (2018). Socio-demographic determinants of malnutrition among school going children in an urban slum area of central India with special reference to nutritional anaemia. *International Journal Of Community Medicine And Public Health*.
14. 14.Bhattacharyya, H., Medhi, G., Pala, S., Sarkar, A., Lynrah, W., & Kharmujai, O.M. (2020). Nutritional status and personal hygiene practices of primary school children: A cross-sectional study from Meghalaya, India. *Journal of Family Medicine and Primary Care*, *9*, 5506 - 5510.
15. 15.Shivaprakash N, Joseph RB. Nutritional status of rural school-going children (6-12 years) of Mandya District, Karnataka. *Int J Sci Stud.* 2014;2:39–43. [Google Scholar] [Ref list]

16. 16.Masibo PK, Makoka D. Trends and determinants of undernutrition among young Kenyan children: Kenya Demographic and Health Survey; 1993, 1998, 2003 and 2008–2009. *Public Health Nutr*. 2012;15:1715–27. [PubMed] [Google Scholar] [Ref list]
17. 17.O'Donnell OA, Wagstaff A. *Analyzing Health Equity using Household Survey Data: A Guide to Techniques and their Implementation*. Philadelphia, USA: World Bank Publications, Saunders; 2008. [Google Scholar] [Ref list]
18. 18.Aheto JMK, Keegan TJ, Taylor BM, Diggle PJ. Childhood malnutrition and its determinants among under-five children in Ghana. *Paediatr Perinat Epidemiol*. 2015;29:552–61. [PubMed] [Google Scholar] [Ref list]
19. *Indian Council of Medical Research; 2009-2010*. Jamai-Osmania, Hyderabad: National Institute of Nutrition; Nutrient Requirements and Recommended Dietary Allowances for Indians; A Report of the Expert Group of the Indian Council of Medical Research 2009-2010. [Google Scholar]
20. 20.de Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. *Bull World Health Organ*. 2007;85:660–7. [PMC free article] [PubMed] [Google Scholar] [Ref list]
21. Patel N, Gunjana G, Patel S, Thanvi R, Sathvara P, Joshi R. Nutrition and health status of school children in urban area of Ahmedabad, India: Comparison with Indian Council of Medical Research and body mass index standards. J Nat Sci Biol Med. 2015 Jul-Dec;6(2):372-7. doi: 10.4103/0976-9668.160010. PMID: 26283833; PMCID: PMC4518413.
22. 21.Reema Mukherjee and Sanjay Chaturvedi, A study of the dietary habits of school children in Pune city, Maharashtra, India. https://www.ijcmph.com/index.php/ijcmph/article/view/618.International Journal of Community Medicine and Public HealthMukherjee R et al. Int J Community Med Public Health. 2017 Feb;4(2):593-597