



Study of nutritional status, socioeconomic status & morbidity pattern of male adolescent residing in slum area of Raipur city, Chhattisgarh

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ABSTRACT

Introduction- In India most of population of adolescent residing in village and slum area. The health status of adolescent of slum of Raipur city remains unstudied therefore the present study was undertaken to assess the severity of undernutrition and morbidity pattern in male adolescent.

Material & method - 600 adolescent males living in slum area were undergone anthropometric measurement, detail socioeconomic history, history of past illness and clinical examination to assess nutritional status & morbidity pattern.

Result- among studied sample 66.16% were undernourished. 76.35% population were anemic. Majority of working adolescent encountered minor health illness, vitamin & micronutrient deficiency. Addiction were increasing in adolescent age group.

Conclusion - In current study we found high prevalence undernutrition and morbidities in male adolescent of slums needs rigorous implementation of nutritional programmes and health services.

KEYWORDS : Undernutrition, Adolescent, Addiction, Body Mass Index

Introduction

Adolescence is a transition stage of physical and mental development that occurs between 10 to 19 years. Nearly one sixth population are constituted by adolescent. Adolescent health is therefore an important component of global health. Poor nutritional status during adolescent is an important determinant of health outcome. In India most of population of adolescent residing in village and slum area of city therefore these groups underprivileged to health amenities, education and awareness. The prevalence of undernutrition in children is an indicator of community health status. The health status of adolescent of slum of Raipur city remains unstudied therefore the present study was undertaken to assess the severity of undernutrition and morbidity pattern in male adolescent^{1,2,3}.

Material and methods

This study was based on cross-sectional, analytical study conducted during period from September 2012 to September 2013. Permission was taken from Institutional Ethical Committee before starting of study. Sample size was 600, male adolescents aged between 10 – 19 years. Eligibility criteria – cases were age group 10 to 19 years those who have been residing in slum area of Raipur city & Exclusion criteria – adolescent with chronic systemic illness.

Method of data collection – subject were chosen from different slum of Raipur city. The list of male adolescent of different slum area of Raipur taken and randomly about 15 cases were selected from each cluster. The subject were interrogated through personal interview and questionnaire. After history regarding socioeconomic condition, addiction, past medical illness, detail clinical examination was done after gaining of confidence including measurement of anthropometry for evaluation of nutritional assessment.

Age was recorded in year. For measurement height asked the child to stand straight, barefoot on the ground with heels, buttocks, upper back, and occiput must be firmly contact with the wall. The chin is tucked in slightly and the head is held erect. The cardboard was pressed firmly onto the subject's head to form a right angle to the wall. Weight was recorded using standard weighing machine. Weight was measured at the same time of day, with same machine and to the same degree of accuracy to the nearest of 0.5 kg. Body Mass Index was calculated based on the formula⁴- BMI = Weight in kilogram / (Height in meter)².

Each case was examined thoroughly for assessment of anemia, feature for deficiency of various vitamins, detail general and systemic

examination, and important sign of any communicable or contagious diseases were noted.

Statistical analysis - The observation were depicted in tabulated form and different variable were analyzed statistically by mean of appropriate statistical methods. Chi-square test and probability value ('p' value) determined after applying student 't' test to find out association between attributes.

Result

In present study Maximum number 125, 20.83%, proportion 0.2080 and C.I. of proportion 1369-0.2791 of adolescent were 10 years of age group and minimum were 8, 1.33%, proportion 0.013 and C.I. of proportion -0.0663-0.0923 were in 19 years of age group. & maximum number of cases belongs to early adolescent (69%, proportion 0.69, C.I. of proportion 0.6457-0.7343) middle adolescent (20%, proportion 0.20 C.I. of proportion 0.1285-0.2715), and minimum number were late adolescent 11%, proportion 0.11, C.I. of proportion 0.0346-0.1854

Table 1 showed Maximum Number of undernourished belongs to 12 years (89.07%, proportion 0.8907, C.I. of proportion 0.8327-0.9444) followed by 11 years 88.88, proportion 0.8888, C.I. of proportion 0.8295-0.9480 then 10 years (83.20, 0.8320, 0.7664-0.8975) and 13 years (70.96, 0.7096, 0.5966-0.8225) overall early adolescent (10-13) were main group belongs to < 5th centile (88.16%). There was no one (17-19 years) found BMI < 5th percentile. Undernourished adolescent were (66.16%, proportion 0.6616, CI of proportion 0.6150-0.7081), normal BMI were (31.83%, proportion 0.3183, CI of proportion 0.2522-0.3843), and overweight were 02%, proportion 0.02, CI of proportion 0.05920-0.0992 and no cases was found to obese.

Table 2 showed education of adolescent male were mainly primary passed (55.33%, CI of proportion 0.5135-0.5930) followed by middle (34%, CI of proportion 0.320-0.3779), higher secondary (6.66%, CI of proportion 0.0467-0.0864) and uneducated (4%, CI of proportion 0.0243-0.0556). In this study BMI < 5th Centile (66.66%), (66.26%), (66.17%), (65%) in uneducated, primary level, middle level, higher secondary respectively. Normal BMI (5th-84th Centile) (33.33%), (31.16%), (31.86%), (32.5%) in uneducated, primary level, middle level, higher secondary respectively. Overweight 85th-94th Centile seen in uneducated (00), primary level (2%), middle level (0.49%), higher secondary (2.5%).

Table 3 showed 20%, proportion 0.200, CI of proportion 0.1244-0.2756 were working whereas 80%, proportion 0.8, CI of proportion

0.7642-0.8756 were non working male adolescent. In this study early adolescent were mainly non working 99.51%, proportion 0.9951. And workings were 0.49%, proportion 0.0049. Mid adolescent working (44.17, proportion 0.4417), non working (55.83, proportion 0.5583) and in late adolescent working (95.48, proportion 0.9448) non working (1.51, proportion 1.51). The two sided p value is <0.001, considered extremely significant with 95% confidence interval 0.08127 to 0.1346.

In this study we found that undernourished (<5th Centile) working adolescent were 32.5% while non working were 74.58%. Normal BMI (5th-84th Centile) in working seen in 61.66% and in non working were 24.34%. Overweight (85th-94th Centile) found 5.83% in working whereas 1% were non working. No obese were found in any group. Two sided p value is <0.0001, consider extremely significant with 95% confidence interval 0.1748 to 0.3468 and 95% confidence interval of difference 0.2331 to 0.3684.

When working cases were split into early, mid and late adolescent BMI were <5th centile 100%, 60%, 45% respectively. Normal BMI was 38%, 40% in middle and late adolescent respectively .overweight were 2%, 15% in middle and late adolescent. There were no cases found to normal BMI, overweight and obese in early adolescent. Two sides p value is 0.0897 considered not quite significant. 95% confidence interval of difference -0.007303-0.3498

Similarly in non working group early, mid and late adolescent BMI were <5th centile 70%, 67%, 00% respectively. Normal BMI was 30%, 33%, 0% in early, middle and late adolescent respectively. In late adolescent 100% cases were overweight but no one is found undernourished, normal BMI, and obese. Two sided p value is 0.6700, considered not significant with 95% confidence interval 0.9934 to 1.021.

In this study when compared with addiction with education it is found that 79.16%, 22.89%, 11.76%, 7.5% adolescent were indulge in addiction in following in relation to education uneducated, primary level, middle and higher secondary respectively. The two sided p value is <0.001, considered extremely significant with 95% confidence interval 0.1725 to 0.2958.

Table 4 showed Number of upper respiratory tract infection encountered <5 episode 85%, 11% were 5-10 episodes and 4% were > 10 episodes in one year. Prevalence of anemia out of 600, 458(76.34%, proportion 0.7634, CI of proportion 0.7244-8023) cases were anemic and 142(23.66%), proportion 0.7634, CI of proportion (1667-0.3055) were non anemic. Incidence of substance abuse were 20.33 in which gutkha (65.57%) smoking (25.40%), alcohol (9.01%) respectively. Other common nutritional deficiencies were Vitamin A deficiency (38%),

Vitamin B deficiency (27.4%), Vitamin C deficiency (5.7%), and Vitamin D deficiency (6.35%). Most common health related problem identified were poor personal hygiene (72%), followed by ENT infection (62.4%), skin infection (39%), poor oral hygiene (36.7%), dental disorder (32.6%) and worm infestation (13.8%).

Discussion

In present study we focused on various nutritional and health issue of adolescent boys who belongs to slum. We found maximum number of undernourished adolescent belongs to 12 years of age group. Similar finding seen by bannerjee et al 2004. If we compare age wise undernourishment with WHO standard data were different because racial variation, better nutrition and better socioeconomic environment leading to better growth. If compare BMI in present study where 66.16% adolescent were undernourished. in Other similar study A.K.M. shahabbudin et al (67%), K.anand at al (43.8%), A.N.Kanade et al(70%), Rao K.M et al(51%), P.R.deshmukh et al(53.8%), Aparajita Dasgupta et al(47.93%) found undernourished adolescent^{5,6,7,8,15}.

The number of undernourished adolescent in non working group were more than working because most of nonworking adolescent belongs to group of early adolescence. similar study in working adolescent conducted by Omokhodian et al , Mallik S et al & Caglayan. C. et al and found variable result. When BMI compared with addiction in present study we found that undernourished is found in 79.5% addicted adolescent. Jeniffer A et al found BMI were less in smokers^{9,10,11,12}.

If look prevalence of anemia present study found that 76.34% cases were anemic as compared to other studies Dharma S et al(72%), Malik S et al (49.3%), Anand K.et al (41.3%).When compared education to addiction current study show inversely relation^{3,6}.

20.33% adolescent were indulge with substance uses mainly gutkha/gudakhu. Similar result were obtained by Dharam S et al (2008) and Sarangi L et al^{3,14}. This might be due to ,habit of parents working environment ,friend circle. After anemia vitamin A & B deficiency more common due to poor nutrition intake. Similar finding were obtained by Dharma S et al & Rao K.M et al. Worm infestation may be important causative factor for anemia¹⁶. Poverty , poor education level and quality are major factor for undernutrition and anemia among adolescent .Majority of working adolescent encountered to skin, ENT disordered, vitamin & micronutrient deficiency and addiction.

Therefore it can be recommended that effort should be for uplift of nutritional status of adolescent and eliminate working strain .This requires implementation of various programme for adolescent health improvement.

Table 1 Age wise distribution of under nutrition

Age in years	No.of caeses	BMI <5 th Centile	Undernutrtion (%)	Proportion	C.I.of Proportion
10 years	125	104	83.20	0.8320	0.7664-0.8975
11 years	108	96	88.88	0.8888	0.8295-0.9480
12 years	119	106	89.07	0.8907	0.8327-0.9444
13 years	62	44	70.96	0.7096	0.5966-0.8225
19 years	71	24	33.82	0.3382	0.2315-0.4448
15 years	49	20	40.81	0.4081	0.2704-0.5457
16 years	25	03	12.00	0.1200	0.0073-0.2473
17 years	20	00	00.00	0.0000	00.00-00.00
18 years	13	00	00.00	0.0000	00.00-00.00
19 years	08	00	00.00	0.0000	00.00-00.00
Distribution of cases according to BMI					
BMI					
<5 th Centile	397	66.16	0.6616	0.6150-0.7081	
5 th -84 th Centile	191	31.83	0.3183	0.2522-0.3843	

85 th -94 th Centile	12	02.00	0.02	-05920-0.0992
>95 th Centile	00	00.00	0.00	00.00

Table 2 Distribution according to Education level of adolescent male

Education	No.of cases	%	Proportion	CI of proportion
Uneducated	24	4	0.0400	0.0243-0.0556
Primary level	332	55.33	0.5533	0.5135-0.5930
Middle level	204	34.00	0.3400	0.320-0.3779
Higher secondary	40	06.66	0.0666	0.0467-0.0864

BMI compared to Education level

BMI	Uneducated	Primary level	Middle level	Higher secondary
<5 th Centile	16(66.66%)	220(66.26%)	135(66.17%)	26(65%)
5 th -84 th Centile	08(33.33%)	105(31.16%)	65(31.86%)	13(32.5%)
85 th -94 th Centile	00	07(2%)	01(0.49%)	01(2.5%)
>95 th Centile	00	00	00	00

Table 3 Distribution of cases according to working condition

	No. of cases	%	Proportion	CI Proportion
Working	120	20	0.200	0.1244-0.2756
Non working	480	80	0.800	0.7642-0.8756

Distribution of adolescent stage and working condition

	Working	%	Proportion	Non working	%	Proportion	CI Proportion
Early Adolescent	02	0.49	0.0049	412	99.51	0.9951	0.9883-0.9957
Mid Adolescent	53	44.17	0.4417	67	55.83	0.5583	0.4695-0.6471
Late Adolescent	65	98.48	0.9448	01	1.51	1.51	-0.0069-0.0371

Effect of working condition on BMI

BMI	Working	Proportion	CIP	Non working	Proportion	CI Proportion
<5 th Centile	39(32.5%)	0.3250	0.2789-0.3710	358(74.58%)	0.7458	0.6998-0.7918
5 th -84 th Centile	74(61.66%)	0.6166	0.5927-0.6855	117(24.37%)	0.2737	0.1748-0.3126
85 th -94 th Centile	07(5.83%)	0.0583	0.0742-0.1908	05(1%)	0.0100	-0.1225-0.1425
>95 th Centile	00	00	00	00	00	00

Table 6 Distribution of cases according to Nutritional & other health related problem

	No. of cases	%	proportion	CI of proportion
Anemia	458	76.34	0.7634	0.7244-8023
Non anemic	142	23.66	0.2366	0.1667-0.3055
Smoking	31	25.40	0.2540	0.1767-0.3312
alcohol	11	9.01	0.0901	0.0393-0.1408
Vitamin A deficiency	228	3827.4	0.38	0.3170-0.4429
Vitamin B deficiency	164	5.7	0.274	0.2057-0.3422
Vitamin C deficiency	34	6.3	0.057	-0.0209-0.1349
Vitamin D deficiency	39	72.7	0.063	-0.0132-0.1392
Poor personal hygiene	436	36.7	0.727	63.96-81.43
Poor oral hygiene	220	39	0.367	27.25-46.14
Skin infection	234	62.4	0.39	29.44-48.55
ENT infection	374	13.8	0.624	52.9-52.91
Worm infestation	83	32.6	0.138	07.04-20.55
Dental disorder	196		0.326	23.41-41.78
Gutkha/gudakhu	80	65.57	0.6557	0.5714-0.7400

REFERENCES

1. Bezbaruah, Supriti, and Mandeep K. Janeja. Adolescents in India, a Profile. UNFPA for UN system in India, 2000. | 2. Rao S. Nutritional status of Indian population. *J Biosci* 2001; 26:481-9. | 3. Singh, Dharam, et al. "Street children of Udaipur: Demographic profile and future prospects." *Stud Tribes Tribals* 6.2 (2008): 135-39. | 4. World Health Organization. *Physical Status: The Use and Interpretation of Anthropometry*. Technical Report Series 854. Geneva, World Health Organization, 1995; pp 263-308. | 5. PR Deshmukh, SS Gupta, MS Bharambe, A R Dongre, et al. Nutritional status of adolescents in Rural wadhwa IJP, Vol 73-feb 2006. | 6. Anand K, Kant S, Kapoor SK. Nutritional Status of Adolescents school children in rural north India. *Indian Pediatr*. 1999;36:810-5. [PubMed: 10744863] | 7. Kanade, A. N., S. B. Joshi, and S. Rao. "Undernutrition and adolescent growth among rural Indian boys." *Indian pediatrics* 36 (1999): 145-156. | 8. Dasgupta, Aparajita, et al. "Assessment of malnutrition among adolescents: Can BMI be replaced by MUAC." *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine* 35.2 (2010): 276. | 9. Shahabuddin, A. K. M., Talukder, K., Talukder, M. K., Hassan, M. Q., Seal, A., Rahman, Q. & Costello, A. (2000). Adolescent nutrition in a rural community in Bangladesh. *The Indian Journal of Pediatrics*, 67(2), 93-98. | 10. Omokhodion, Folashade O., and Samuel I. Omokhodion. "Health status of working and non-working school children in Ibadan, Nigeria." *Annals of Tropical Paediatrics:International Child Health* 24.2 (2004): 175-178. | 11. Fidler, Jennifer A., et al. "Smoking status of step parents as a risk factor for smoking in adolescence." *Addiction* 103.3 (2008): 496-501. | 12. Caglayan, Cigdem, et al. "Working conditions and health status of child workers: Cross sectional study of the students at an apprenticeship school in Kocaeli." *Pediatrics International* 52.1 (2010): 6-12. | 13. Rao, K. M., Balakrishna, N., Arlappa, N., Laxmaiah, A., & Brahmam, G. N. V. (2010). Diet and nutritional status of women in India. *J Hum Ecol*, 29(3), 165-170. | 14. Sarangi, Lisa, Himanshu P. Acharya, and Om P. Panigrahi. "Substance abuse among adolescents in urban slums of Sambalpur." *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine* 33.4 (2008): 265. | 15. Chowdhury, Sutanu Dutta, Tarun Chakraborty, and Tusharkanti Ghosh. "Prevalence of undernutrition in Santal children of Puruliya district, West Bengal." *Indian pediatrics* 45.1 (2008): 43. | 16. VG RA, Aggraval MC, Yadav R, Das SK, Sahare LK, Bondy MK, et al. Intestinal parasitic infections, anaemias and undernutrition among tribal adolescents of Madhya Pradesh. *Indian J Community Med*. 2003;28:26-8. |