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Editorial Article

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Toilet for all by 2019, can India reach there?

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Honourable Prime Minister Shri Narendraji Modi has launched Swachh Bharat Abhiyan programme on 2nd October 2014. The Govt. of India is committed to end the practice of open defecation by 2019 as a token of tribute to Mahatma Gandhi on his 150th birth anniversary. Beyond debate, toilet is one of the basic necessities of every household and one of the important criteria to assess where we stand in public and private health. On the other hand, about 50% on Indian population (around 600 million) have habit of open defecation. Open defecation causes many public health problems including many water & insect borne diseases which most Indian are not aware of, resulting in stunted growth & poor intelligent quotient (IQ) in young children. It is really a great idea to provide a toilet to every Indian household.^[1]

Let us assess the causes for such unhealthy practices. First is Indian mindset. Open defecation is a many century old tradition. Water sealed toilet in a western invention brought to us by British. One recent survey shows that many rich farmers of rural Uttar Pradesh, Haryana & Punjab prefer open defecation in spite of having household toilet. Many people enjoy morning breeze & openness of nature in the process than that of a closed room. At the same time, multiple government schemes have given incentives to construct household toilets. Another practical problem for big part of rural India is majority of household do not have sufficient amount of water for cleaning, flushing the toilet. Dry toilet is still in practice with shameful act of manual scavenging. So, dry toilet can never be the option to eradicate open defecation. Then what is the answer to this shameful state of public health?^[2]

First to construct a real toilet in every household with incentive or vouchers for cement, iron, pan, pipes etc instead of cash. This will bring down the construction cost and will help who cannot afford the same. Second is to make sufficient water available for flushing. This is a

more difficult problem in many dry part of India which needs special initiative to address.

Last, but not the least, is to change the mindset/attitude of young people. It is not possible to achieve this without active participation of community. Major community involvement is must with commitment involving young men & women. First of all, people must be convinced beyond doubt about the same. They must be the messenger for the rest making it a social movement. It is a very distant dream for India with all its complexity. Let us join hands for that distant & difficult dream, because every reality starts with a dream.

References:

1. 10 crore toilets to be constructed by 2019: Govt of India. The Times of India, 2015 March 15: Pg- 6 [Last accessed on 25 May 2017.] <http://timesofindia.indiatimes.com/india/10-crore-toilets-to-be-constructed-by-2019-Govt/articleshow/46573620.cms>
2. Saptarshi Dutta. Swachh Bharat Abhiyan: Can India Become Open Defecation Free By 2019? May 30, 2017. [Last accessed on 15 June 2017.] <http://swachhindia.ndtv.com/swachh-bharat-abhiyan-can-india-become-open-defecation-free-by-2019-7566/>

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SHORT ARTICLE

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Retrospective Analysis of Demographic and Clinical Profile of Dengue Infection in a Tertiary Care HospitalDenesh Narasimhan¹, Silpita Katragadda²

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Abstract

Background: Dengue infection is an exceedingly common cause of fever in the tropical countries. **Aim:** to study the demographic and clinical profile of Dengue patients. **Design:** Retrospective observational study of serologically proven dengue cases. **Methods and materials:** the study included Dengue patients admitted in PSG Hospital between January 2011 and December 2012. **Results :** Dengue infection was found to be more common in the younger age groups. It was more common in men. It was prevalent across all occupational profiles. The common clinical features included fever, myalgia, headache, abdominal pain, diarrhea and arthralgia. Bleeding manifestations included mucosal and skin bleeds and the commonest bleeding manifestation was melena. There was no major life threatening bleeds. Analysis of the hematological profile showed that nearly 91.5% of patients had thrombocytopenia with 48.9% having severe thrombocytopenia. **Conclusion :** Dengue infection is an important differential diagnosis for acute febrile illness in the tropics which can present with multiple non specific and systemic symptoms with a high incidence of thrombocytopenia.

Key-words: Dengue, Coimbatore, Demography, Tropical, Symptoms

Introduction

The word dengue is derived from Spanish in which it means “affectation”, “careful” or “fastidious” probably to describe the cautious stiff movements of patients suffering from it due to muscle, bone and joint pain. It was considered a sporadic disease in the 19th century. With the advent of globalization and increased travel, the incidence of dengue has increased 30-fold over the past century to become endemic in 112 countries in the world (1). About 50 million people develop dengue infection every year and 2.5 billion people live in endemic areas. (2). Dengue infection is a very important health problem affecting many tropical countries. Dengue is one of the important causes of undifferentiated fevers in India along with malaria, typhoid and other viral infections. Various endogenous studies are available in India, most of which have evaluated a few aspects of the disease spectrum. Some studies have documented the extent of epidemics with data collected during that period. There have been increasing reports of dengue infection with newer manifestations, mainly with hepatic and cerebral symptoms in the past (3,4). We designed a descriptive

study of adult dengue infection to describe the demographic and clinical profile. The aim of the study is to provide data on dengue infection in a tertiary care location in Tamil Nadu.

Materials and methods

This study was a retrospective analysis of patients who were admitted in the medical wards of PSGIMSAR with febrile illness and diagnosed to have dengue infection by serological analysis. These were mainly adult patients and were admitted between January 2011 and December 2012. All patients screened for this study had undergone dengue serology and only patients who were dengue IgM positive and greater than fifteen years of age were included in this study. Patients with other causes for fever and with coexisting infections were excluded from this study. Demographic data regarding age, gender, occupation and location were collected and tabulated. The spectrums of clinical features were noted. Complete blood count was assessed by coulter.

Results

Our present study was a retrospective analysis of patients presenting to our hospital in the years 2011-2012 who tested serologically positive for dengue infection. We performed a retrospective analysis of demographic and clinical profile of 235 patients with dengue infection who were admitted to our hospital. In our present study, the incidence of dengue infection had the highest incidence between 15-40 years. [FIG 1]. Of the 235 cases of dengue infection 60(25.5%) were primary dengue and 175(74.5%) cases were secondary dengue infection. Among 235 dengue patients, 144 were male and 91 were female. Occupational profile showed equal distribution of blue collar workers (unskilled workers) and students with lesser incidence in house wives and white collar (skilled) workers.[FIG 2]. In our study the commonest symptoms were fever [92%] followed by myalgia [40.4%], headache [42.4%], vomiting [40.4%].[FIG 3].Hepatomegaly seen in 6.80%, Splenomegaly1.30%, lymphadenopathy 0.40%,Pleural effusion 6.40% and abdominal findings 14.90% of individuals. Bleeding manifestations happened in 26.8 % of patients, the commonest of which was melena [7.20%], followed by gum bleeds, ecchymosis,, hematemesis, petechiae and purpura[FIG 4]. When the presence of thrombocytopenia was analyzed, it was found that 91.5% of the patients had low platelet counts [<150000 cells/mm³].

Fig.1. Prevalence of Dengue infection with age

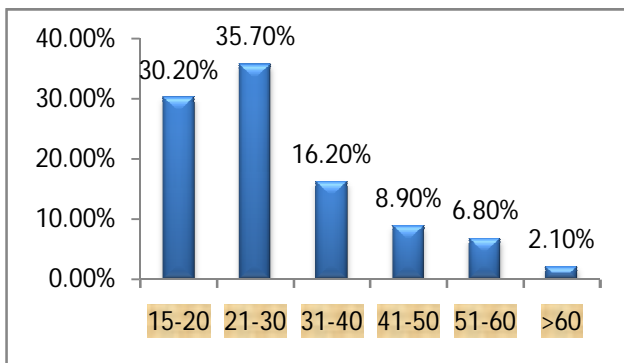


Fig 2.Occupation of Dengue infection

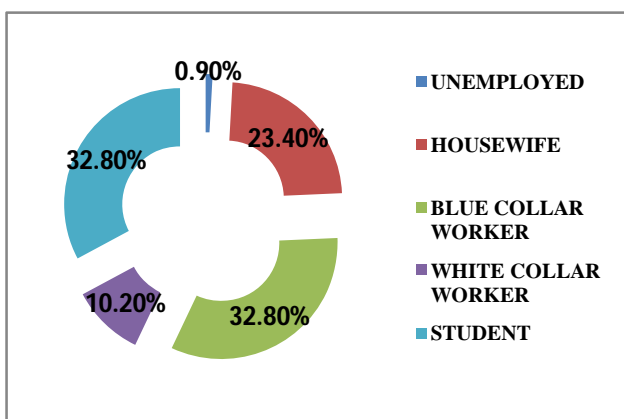


Fig 3.Symptoms of Dengue infection

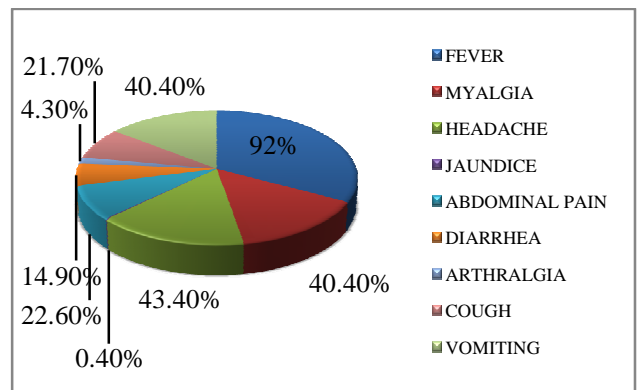
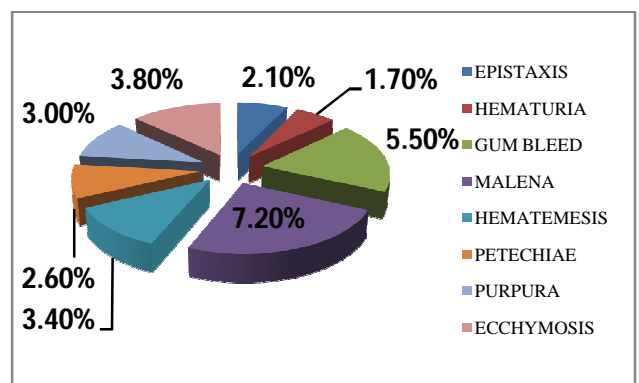


Fig 4.Bleeding Manifestation in Dengue infection



Discussion

There are 2.5 billion people living in the tropical & sub-tropical zones who are at risk of acquiring infection due to ideal environmental conditions for the transmission of dengue virus by Aedes mosquitoes. Outbreaks have occurred in five of six WHO regions over the past 50 years (1). Most of the cases of dengue infection are found in south east Asia and western pacific though it is prevalent in many countries.(2).

Our study included patients above 15 years. The incidence of dengue was least in the older age groups probably in our view because of lesser outdoor activity compared to younger people. This was similar to a study performed by Amir Khan et al (5).n a study by Khoa T.D.Thai et al (6) showed that increasing age lead to increasing risk of clinical attack in both primary and secondary dengue infection. This study was done by obtaining seroprevalence of dengue specific for age and frequency of clinical attack specific for age. This study included pediatric population and the average age of patients with primary and secondary dengue infection were 12 and 20 years respectively.

Our study showed a male preponderance in concordance with a study done by Prafulla Dutta et al (7)and Amirkhan et al(5). Another study from Prasith et al from Lao People’s Democratic Republic’s also showed a similar male preponderance of dengue infection (8). Majority of the patients were from Coimbatore and nearby districts.

In relation to occupational profile our study differs from the study by Prafulla Datta et al where majority of the patients were blue collar workers (7). This was because their study population was from a rural location and ours is from an urban location.

Secondary dengue infection was more common than primary dengue infection indicating that the majority of the patients had already had an attack of dengue infection.

In addition to the more common complaints such as fever, myalgia, headache, other symptoms included abdominal pain, diarrhea, arthralgia and cough. This was more or less similar to other studies from India done by Prafulla Dutta et al with slight differences (7). Their study showed a higher incidence of eye pain (68.5%) which was not present in our study. Our study showed that 20.4% of patients had cough and 40% of patients had vomiting which had not been reported in the 2003 dengue epidemic in the study by Rachel Daniel et al (10). Our study had lesser incidence of abdominal pain when compared to the study by Ritu Karoli et al (12). Abdominal pain may be related to inflammation of serosa. This finding was also similar to another study by Muhammad H et al. (11)

There was no major intracranial bleed on our study. In the study by Rachel Daniel et al showed a lower incidence [15.2%] of bleeding manifestations but with 2 major intracranial bleeds. Their commonest bleeding manifestation was melena which was similar to our study (10). In another study by Ritu Karoli et al, hemorrhagic manifestations were higher in 40% of patients with epistaxis being the commonest symptom (12).

The incidence of thrombocytopenia in our study was 91%, which was higher compared to the study by Prafulla Dutta et al (7) where the incidence of thrombocytopenia was 71.3% and similar to the study by Rachel Daniel et al (10) where it 90%. The majority had severe thrombocytopenia [<50000 cells/mm³] (48.9%), with the rest comprising of moderate [50000-100000 cells/mm³] (25.1%) and mild [100000 to 150000 cells/mm³] (17.4%) thrombocytopenia. The other 8.5% had normal platelet counts.

Conclusion: This study is a retrospective analysis capturing the demographic and clinical profile of dengue patients. Dengue infection forms an important differential diagnosis of acute febrile illness in the tropics. Since this was a retrospective analysis, not all aspects could be looked into. In future, there is a need for analysis of biochemical parameters of dengue patients.

References

1. G N Malavige¹, S Fernando¹, D J Fernando, S L Seneviratne. Dengue viral infections Postgrad Med J 2004;80:588-601

2. Dengue guidelines for diagnosis, treatment, prevention and control new edition. Geneva: World Health Organization; 2009. WHO.page 3
3. Cam BV, Fonsmark L, Hue NB et al. Prospective case-control study of encephalopathy in children with dengue hemorrhagic fever. American Journal of Tropical Medicine and Hygiene 65, (2001) 848–851.
4. Pancharoen C & Thisyakorn U, Neurological Manifestations in Dengue Patients. Southeast Asian Journal of Tropical Medicine and Public Health 32, (2001) 341–345.
5. Amir Khan, Shams Ur Rehman, Rizwan Ullah. Demographic profile, clinical presentation and outcome of dengue fever in mardan medical complex teaching hospital, KJMS. January-June, 2013, Vol. 6, No. 1
6. Thai, K. T. D., Nishiura, H., Hoang, P. L., Tran, et al. Age-specificity of clinical dengue during primary and secondary infections. PLoS Neglected Tropical Diseases, 5(6), (2011). e1180.
7. Dutta, P., Khan, S., Borah, J., & Mahanta, J. Demographic and Clinical Features of Patients with Dengue in Northeastern Region of India: A Retrospective Cross-Sectional Study during 2009-2011. Journal of Virology & Microbiology, 2012, 1–11.
8. Prasith, N., Keosavanh et al. Assessment of gender distribution in dengue surveillance data, the Lao People's Democratic Republic. Western Pacific Surveillance and Response Journal : WPSAR, 4(2), . (2013). 17–24.
9. Dengue guidelines for diagnosis, treatment, prevention and control new edition. Geneva: World Health Organization; 2009. WHO. page 91
10. Rachel Daniel, Rajamohanam and Aby Zachariah Philip. A Study of Clinical Profile of Dengue Fever in Kollam, Kerala, India (2005). A Study of Clinical Profile of Dengue Fever, Dengue Bulletin Vol 29, 2005. 29, 197–202.
11. Muhammad, H., Khan, S., Khan, B. A., Arif, M., & Raza, A. (2012). Retrospective Analysis of 68 Cases of Dengue Fever, Pak J Med Res Vol. 51, No. 1, 2012.
12. Karoli, R., Fatima, J., Siddiqi, Z., Kazmi, K. I., & Sultania, A. R. (2010). Original Article Clinical profile of dengue infection at a teaching hospital in North India, (October), J Infect Dev Ctries. 2012 Jul 23;6(7):551-4

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Tobacco use and health: Case control study in rural Kerala**Anant T. Pawar¹, Shankar Bhosale², Durgesh Kumar³**

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Abstract

Context: Tobacco is the foremost cause of preventable death in the world. Tobacco use causes a wide range of major diseases which impact nearly every organ of the body. Tobacco is not only causing cancers, heart diseases and lung diseases but also responsible for overall ill-health increasing visits to health centres. Kerala even though has better health indicator values than rest of country. Tobacco use is highly prevalent in the state of Kerala. **Aim:** To study association between tobacco use and ill-health (visit to health services for treatment of any illness). **Material and Methods:** Case control study was conducted in rural area of Kerala. Fifty patients visiting Community health centre for medical care for any illness other than accidents and injuries formed cases and 150 apparently healthy age, sex, etc. matched individuals from general population in field practice area formed controls. Cases and controls were interviewed using predesigned questionnaire to know tobacco consumption practices among them. **Statistical analysis used:** Data was analysed using SPSS 16. Percentages, t test, chi-square test and odds ratio were used. **Results:** In the present study 80% cases were tobacco users; while 64% controls were tobacco users. In the present study use of tobacco was significant risk factor for overall ill-health (odds ratio 2.25 [1.04-4.85]). Ill health was significantly associated with number of cigarettes smoked and mean years of smoking. **Conclusions:** Tobacco use is responsible for overall ill-health increasing visits to health centre. It also causes economic loss.

Key-words: Tobacco, smoking, ill-health, health services, Kerala

Introduction

Tobacco use is one of the most alarming health problems in the world today. Tobacco is a marketed malady and its use is an engineered addiction which is the foremost cause of preventable death in the world. Tobacco use causes a wide range of major diseases which impact nearly every organ of the body. These include several types of cancers, heart diseases and lung diseases.^[1] Tobacco use currently accounts for 4.83 million deaths annually, which is estimated to double to 10 million deaths every year by 2030, with about 7 million of the deaths taking place in developing countries. This will make tobacco largest cause of death in the world.^[2]

India is the second-largest producer and consumer of tobacco in the world.^[3] The tobacco kills almost 1 million Indians every year and by the year 2020, the number of tobacco-related deaths is projected to be 1.5 million annually.^[4] According to the Indian Council of Medical Research (ICMR), in India each year nearly

160000 people develop cancer, 4.5 million develop heart disease and 3.9 million develop chronic obstructive lung disease as a result of tobacco consumption.^[5]

Health problems related to tobacco use are a major drain on the resources of developing countries. ICMR in its study observed that the Government spent Rs 277.6 billion (US\$ 6.5 billion) in 1999 as cost of treatment of 3 major tobacco-related diseases (cancer, heart disease and chronic obstructive pulmonary disease). The nationwide sale value of all tobacco products during same period was only Rs 244 billion with government getting fraction of it in the form of taxes.^[5] Thus, it may be said that tobacco is of no economic benefit to the nation while being a major health hazard.

Tobacco use is always studied in relation to morbidity and mortality due to major chronic diseases caused by it and huge economic loss due to these diseases. But tobacco consumption also leads to many immediate and serious respiratory and non-respiratory illnesses. Tobacco

consumption increase frequency of utilisation of health services by individuals.^[1] Almost all studies in the past tried to explore association of tobacco with chronic non-communicable diseases. None of the study tried to explore relation of tobacco with impaired health status making individual susceptible to illness.

The existing literature on tobacco use in India suggests that there are major differences in regional trends of tobacco use, both with respect to types of tobacco products used and prevalence rates among specific populations groups. The state of Kerala representing 3% of total population of India is known for better health indicator values than other states of India. However 'Tobacco control' is one area where the state is on par with other states in India.^[6,7] A 1987 study covering the entire rural area of the state found that 53% of men >15 years of age were current smokers, 13% were chewers of some form of tobacco (or tobacco and betel quid), and 2% used snuff.^[8]

With this background study was done to study relationship between tobacco use and overall ill health leading to use of health services.

Material and Methods

The case control study (hospital and community based) was conducted in the Mukkam Panchayat of Kozhikode district, Kerala, India. All Male patients above age of 20 years attending evening OPD of Community Health Centre, Mukkam for treatment of any condition excluding accident and injury formed cases while healthy males above 20 years of age from field practice area of Medical College formed controls. A structured questionnaire was prepared to understand the tobacco habit among cases and controls including socio demographic profile of subjects. A total of 50 patients attending OPD on selected date fulfilling inclusion criteria and giving consent to participate in study were interviewed by trained house-surgeon posted for Community Medicine posting in CHC. A total of 150 healthy matched controls from field practice area of Medical College who gave consent to participate in study were interviewed by trained students. The data was entered in M.S. Excel and analysed using SPSS 16 version. Mean, percentage, Chi- square, risk ratio and student t test were used for statistical analysis. P value less than 0.05% was considered as significant.

Results

The present study included 50 cases (patients with any disease attending CHC for treatment) and 150 healthy controls from general population. Forty cases and 96 controls were using tobacco in the form of either smoking or chewing or both. Comparison of some socio-demographic characters among cases and controls is shown in Table 1. It is evident that cases and controls are comparable in characters such as age, income, marital status and family type.

Table 1: Comparison of socio-demographic characters among cases and controls

Variable	Cases	Controls	t value/ value	p value	
Age	44.98±1 4.54	45.95±14. 43	0.412	0.681	
Income	5559 ± 7032	5413 ± 8159	0.113	0.91	
Marital status	Married Unmarried	48 2	141 9	0.289	0.591
Family type	Nuclear Joint	39 11	114 36	0.83	0.773

Table 2: Association of tobacco use and health

Variable	Cases	Controls	Odds ratio	p value
Smoking	34	84	1.67 (0.84-3.28)	0.135
Chewing	9	16	1.83 (0.75-4.47)	0.175
Any form of tobacco	40	96	2.25 (1.04-4.85)	0.036
Years of smoking	25.5±14.25	18.17±12.27	- NA -	0.005
No. Of cigarettes smoked	14.3±7.98	9.8±8.43	- NA-	0.008

Table 2 shows relation of tobacco addiction with ill health. In the present study it was observed that overall use of tobacco was significant risk factor for ill health. Tobacco users have 125% more chances of getting ill than nonusers. Even though, independent association of smoking with ill health could-not be established in this study; mean years of smoking and number of cigarettes smoked were significantly high among cases (p value 0.005 and 0.008 respectively).

Discussion

Tobacco use is very rampant in Kerala. Study done by Sankaranarayan^[9] in Thiruvananthapuram district in 1995 reported smoking in 50.1% men above 35 years of age and tobacco chewing in 23.8% of men. A 1987 study covering the entire rural area of Kerala found that 53% of men >15 years of age were current smokers and 13% were chewers of some form of tobacco^[8]. The National Sample Survey (NSS) done in Kerala reported 44.6% prevalence of any form of tobacco use among all men >15 years of age.^[10]

Smoking is estimated to increase the risk for coronary heart disease by 2 to 4 times, for stroke by 2 to 4 times, for lung cancer by 25 times.^[1] Smoking causes

diminished overall health, such as self-reported poor health, increased absenteeism from work, and increased health care utilization and cost.^[1,3] Unfortunately there is very limited work done to study effect of tobacco consumption on overall health. In the present study we could establish relationship between tobacco consumption and diminished overall health making it necessary for person to utilise health services. In the present study ill health was significantly associated with number of cigarettes smoked and years of smoking. It is well documented that tobacco (smoking) harms nearly every organ of the body in general and respiratory and cardiovascular system in particular leading to many diseases and premature death.^[1]

Conclusions: Tobacco use is responsible for overall ill-health among cases increasing their visits to health centre. It also causes economic loss.

References

1. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centres for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2004
2. Mackay J, Eriksen M. The tobacco atlas 2002. Geneva: World Health Organization; 2002. Available at <http://www5.who.int/tobacco/page.cfm?sid=84> (accessed 5 January 2005).
3. Reddy S, Gupta PC. Indian experience with tobacco cessation. In 'Report on Tobacco control in India', Eds Reddy S, Gupta PC. Ministry of Health and Family Welfare. Government of India. 2004: 1.
4. Murray CJ, Lopez AD, eds. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Cambridge, Massachusetts: Harvard School of Public Health, 1996.
5. Pradeepkumar AS, Sailesh Mohan, P. Gopalakrishnan, P. SankaraSarma, K. R. Thankappan, Mark Nichter. Tobacco use in Kerala: Findings from three recent studies. The national medical Journal of India 2005; 18(3): 148-153

6. Thankappan KR, Thresia CU (2007). Tobacco use & social status in Kerala. Indian J Med Res, 2007; 126: 300-8.
7. R Jayakrishnan, Aleyamma Mathew, AnttiUutela, PatrikFinne. A Community Based Smoking Cessation Intervention Trial for Rural Kerala, India. Asian Pacific J of Cancer Prev 2011; 12:3191-3195.
8. Kannan KP, Thankappan KR, Kutty VR, Aravindan KP. Health and development in rural Kerala. A study of linkages between socioeconomic status and health status. Thiruvananthapuram: Kerala Sastra Sahitya Parishad; 1991:98-105
9. Sankaranarayanan R, Mathew B, Jacob BJ, Thomas G, Somanathan T, Pisani P, et al. Early findings from a community-based, cluster-randomized, controlled oral cancer screening trial in Kerala, India. Cancer 2000; 88: 664-73.
10. National Sample Survey Organization. A note on consumption of tobacco in India. Sarvekshana. Journal of the National Sample Survey Organization. 1998; 25: 76-9.

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A descriptive study on risk factors among acute myocardial infarction patients admitted to the coronary care unit of Prince Mitab hospital Sakaka Aljouf.

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Abstract

Introduction and objectives: Worldwide, acute myocardial infarction (MI) continues to be the leading cause of morbidity for hospital admissions. The current study was carried out with an objective to study the clinical, demographic and risk factors associated with MI patients admitted to cardiac care unit of Prince Mitab hospital. **Methods:** This descriptive study captured three-year retrospective data on patients admitted to cardiac care unit (CCU) from the medical records section of Prince Mitab hospital. Thirty percent of acute MI case files of each year from Jan-2013 to Dec-2015 were reviewed. Data was collected on demographic, disease risk factors (smoking, diabetes, and hypertension), and clinical presentation. Descriptive statistics was performed. **Results:** Of 1428 patients admitted to CCU, 270 had MI (19%). Number of admissions to cardiac care unit has risen from 372 patients in year 2013 to 533 patients in year 2015. Males (86%) outnumbered female patients with MI in all three years of study period ($\chi^2= 6.84$; $P<. 05$). Eighty two patients files (30% of each year) were further analyzed for demographic and risk factors. Majority (69.5%) of MI patients were Saudi nationals. Forty percent of patients were in the age group of 46 to 60 years. 42.7% patients were diabetic and 37.8% were hypertensive and 57.4% patients were smokers or ex-smokers. Chest pain (98.20%) was the most frequent presentation. Over all 96% of patients survived an episode of MI at this hospital. **Conclusion:** We conclude that there is an increase in the number of MI admissions from 2013-2015 at prince Mitab hospital. Male gender, diabetes, hypertension and smoking continue to be the leading risk factors for MI.

Key-words: Myocardial infarction, Descriptive, risk factors, Saudi Arabia

A. Introduction

Worldwide, 32 million individuals suffer from acute coronary and a cerebral vascular event every year. Half of these events occur in individuals with an established Coronary heart disease (CHD) and cerebro-vascular disease (CVD).^[1] Patients of stroke or myocardial infarction (MI) are at an increased risk of recurrence of these events.^[2-5] Identifying such patients and offering them preventive treatment would prevent such recurrence and improve survival.

Coronary artery disease (CAD) is a set of disorders affecting heart and blood vessels, a major health problem in both developed and developing countries.^[5-6] In many countries CAD is the major cause of premature deaths.^[7,8] Over the age of 35 years CAD is responsible for one-third of all deaths in United States of America.^[9] This share of deaths due to coronary artery diseases forced the health authorities to focus on primary and secondary levels of prevention.

About 50%-70% of ischemic heart disease is represented by myocardial infarction (MI) and MI continues to be the leading morbidity for hospital admissions.^[10-11] Many factors have been identified related to MI that includes

smoking, diabetes, systemic arterial hypertension and dyslipidemia.^[11-15] Risk factors for myocardial infarction in a retrospective study in Tehran between elderly and non-elderly highlights that diabetes and systolic hypertension were more common among elderly while as male gender, smoking and family history of IHD were more common risk factors among non-elderly population.^[16]

In a large study on the impact of risk factors for acute MI in middle east countries have shown that population attributable risk (PAR) of the nine risk factors was higher in middle east (97.5%) than worldwide (90.4%), elevated apolipoprotein ApoB/ Apo A1 had strongest association with acute MI followed by smoking.^[17] There is a very limited research on community-based prevalence of CAD in Aljouf region of Kingdom of Saudi Arabia. A hospital-based study has shown that CAD is one of leading reason for hospital admissions.^[18]

Kingdom of Saudi Arabia has undergone a huge change in life style, eating habits and tobacco use resulting in an increase in lifestyle related disease like coronary artery disease, hypertension and diabetes.^[19] There are many benefits of growing economy but it is also accompanied by changes in lifestyle that are conducive for atherosclerosis and MI.

As there is a limited data on patients with acute MI in Aljouf region of Saudi Arabia, current study was aimed to explore the number of MI patients and risk factor analysis in patients of MI admitted in prince Mitab Hospital, Sakaka Aljouf region of Saudi Arabia.

B. Methods

Design: This is a hospital based retrospective descriptive study carried out between Dec-15 to Mar-16.

Setting and Sample: Prince Mitab hospital is a secondary care institute of Ministry of Health situated in the capital city of Sakaka Aljouf region. It is a 300-bedded hospital with 15 beds dedicated to cardiac care unit; it provides 24-hour emergency coverage open to everyone and from which appropriate patients are admitted to medical wards when required. This hospital also serves ministry of higher education by allowing clinical training for undergraduate medical students of Aljouf University.

Data on admissions to cardiac care unit was collected from the medical records section. Retrospective data of last three years from Jan-2013 to Dec-2015 was requested from the medical records. A sample of 30% of acute MI patient case files of each year were selected by systematic random sampling and reviewed for data extraction. Data was extracted on a standard proforma developed for this study.

Ethical approval: The study was carried out in accordance with the ethical standards on human experimentation. Data collection was started after ethical clearance from college ethical committee and after proper permission was sought to access the hospital records from Ministry of health Aljouf region.

Data Collection

Data was collected on age, gender, disease risk factors (smoking, diabetes, and hypertension), and clinical presentation of patient admitted with MI.

Statistical analysis

Data was analyzed using SPSS version-18. Data was coded before entry. Data has been presented as descriptive statistics. Chi square test was used for any significant difference between categories, a P < .05 was considered significant.

C. Results

The first part of the results present the admissions of MI over a three-year period from 2013 to 2015 and the second part presents the demographic and risk factor distribution among the admitted patients.

MI admissions to cardiac care unit over a three-year period (2013-2015)

Fig-1 presents the admissions to cardiac care unit of prince Mitab hospital over a three-year period 2013-2015. The admissions to cardiac care unit rose from 372 patients in year 2013 to 533 patients in year 2015. These admissions were a result of variety of reasons for admission that also included patients with myocardial admission that increased in year 2014 to decrease again in 2015.

Fig-1: Total Admissions to cardiac care unit 2013-15

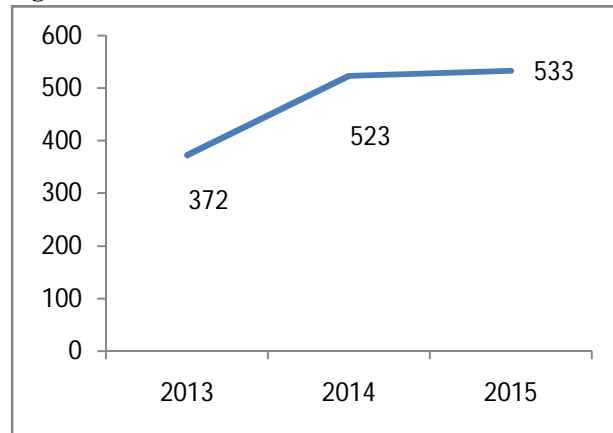


Fig-2: Total Admissions of MI patients to cardiac care unit 2013-15.

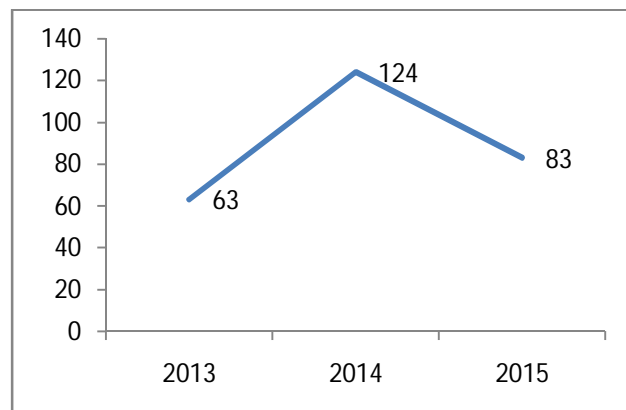


Fig-2 presents the number of admissions with MI to cardiac care unit. There were 63 myocardial infarction

patients admitted to cardiac care unit in year 2013 that nearly got doubled (124) in year 2014 and then decreased to 83 admissions in year 2015. Compared to 2013, there was an increase in the number of MI cases by 31.7% by 2015.

Table-1: MI among males and females year 2013 to 2015

Year	Males	Females	Chi square and P value
2013	58 (92%)	5 (8%)	6.8406,P= 0.032703
2014	103(83%)	21(17%)	(P=<0.05)
2015	78(94%)	5 (6%)	

Table-2: Socio-demographic characteristics of MI patients (N=82).

Demographic Characteristic	Number	Percent
Gender	Male	71 86.6
	Female	11 13.4
Age (in Years)	30-45	21 25.6
	46-60	33 40.2
	60 & above	28 34.1
Nationality	Saudi	57 69.5
	Non-Saudi	25 30.5
Marital status	Married	73 89
	Un-married	9 11
Smoking status	Non-smokers	35 42.7
	Current Smokers	39 47.6
	Ex-smokers	8 9.8

Table-3: Risk factors distribution among MI patients (N=82).

Number	Number	Percent
Diabetes	35	42.7
Hypertension	31	37.8
History of Coronary disease	19	23.2
History of TIA	4	4.9
Family history of Heart disease	14	17.1
Smoker (Ex and current)	47	57.3
Hyper-lipidemia	24	29.3

Table-4: Presenting Symptoms and outcome of MI patients (N=82).

Presenting symptoms	Number	Percent
Chest Pain	74	90.2
Chest tightness	10	12.2
Nausea & Vomiting	15	18.3
Epigastric pain	9	11
Breathlessness	12	14.6

Dizziness	Yes	2	2.4
Fatigue	Yes	3	3.7
Outcome (Survived)	Yes	79	96.3

Male’s outnumbered female’s patients with MI over the three-year study period. There is a wide variation in MI admissions to cardiac care unit between males and females. Results show a significant difference in MI admission between males and females (P<0.05) Table-1.

The second part of the result presents sub-analysis of the selected 30% case files of each study year (Total=82 case files).86.6% of MI patients were males and majority (69.5%) of them were Saudi nationals. 40.2% of the patients were in the age group of 46 to 60 years followed by 34.1% in the age group of 60 and above and.25.6% of patients were in the young age group of 30-45 years. 89% of the patients were married and 47.6% were current smokers (Table-2).

Table-3 presents the risk factor distribution among the study population. 42.7% patients with MI were diabetic and 37.8% were hypertensive. History of coronary artery disease was present in 23.2% of MI patients. 57.3% patients were smokers or ex smokers. 29.3% of MI patients had hyperlipidemia.

Results show that chest pain (90.2%) was the most frequent symptom experienced by MI patients, followed by nausea and vomiting in 18.3%cases. The other common presenting symptoms were breathlessness in 14.6% and chest tightness in 12.2%. 96% of patients survived an episode of MI were only 3.7% died in the hospital (Table-4).

D. Discussion

In men and women CHD is one of the causes of morbidity and mortality in many countries.^[2-5] The number of admission to cardiac care unit in prince Mitab hospital shows a systematic increase from 372 admissions in 2013 to 533 in year 2015, similarly patients admitted with MI has also shown an increase over the three-year study period except for year 2014.

Premenopausal women have less incidence of CHD in the age matched men.^[20] In the present study, 86.6% were males (Male to female ratio of 6.4:1). This is similar to the results in studies from some other Arab countries but higher than from communities in some industrialized countries.^[21-23]

In the present study, diabetes is the most important predictor of MI, probably through its association with pre-existing left ventricular dysfunction and diffuse and rapidly progressive coronary atherosclerosis.^[12,23] The present data indicated that 42.7% of all patients hospitalized at prince Mitab hospital with MI had diabetes. This data shows a higher proportion of patients with DM having MI, This is higher than the 10.5% to 30.0% reported in the other studies conducted in white patients in Britain and south Asian.^[24] However, this higher proportion of DM is also greater than that of

participants with diabetes among Saudi Arabian MI patients.^[20,23] This could be either due to meticulous recording of diabetes among MI patients in prince Mitab hospital or over reporting of this condition.

The current study shows a hypertension prevalence of 37.8% of patients with MI. Hypertension is known to cause ventricular hypertrophy that probably lead to earlier symptoms of MI and also forces patients to seek care, hence being recorded more frequently in patients admitted with MI.^[25]

A recent study suggested that smoking is an important contributor to MI under the age of 36 Years.^[24] Smoking increases the initial and subsequent risk MI and death. Furthermore, smoking and cholesterol having a strong positive association is well established that increases the risk of MI.^[26]

Current study showed that 58% of MI patients admitted to prince Mitab hospital were current (47.7%) or ex-smokers. This is higher than other study carried out by Wilkinson P et al, which showed 17% as smokers.^[23]

Among the presenting symptoms chest pain was frequently reported by MI patients admitted at Prince Mitab hospital being present in 90.2% cases, followed by nausea and vomiting in 18.3% of cases, current results run in conformity with a study conducted by A. R. Abdulkarem et al. who showed chest pain in 89.7% cases of MI as the leading presenting symptom.^[27] Study observed a mortality rate of 3.7% among MI patients over the three year period.

Conclusion

Keeping in view the increasing trend of MI, which carries a high mortality rate, primary preventive activities should focus on the risk factors. Physicians should be encouraged to educate the people about the risks of diabetes, hypertension and smoking. Schools administration should be sensitized to impart health messages on smoking. Public health awareness campaigns should be initiated and should focus on primary prevention and secondary level of prevention by early diagnosis and effective treatment of diabetes and hypertension.

Limitations

This study was carried out by analyzing data of last three years only so results have to be read with caution.

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E.References

1. The World Health Report 2002. Reducing risks, promoting healthy life. Geneva: World Health Organization; 2002.
2. Krumholz HM, Lin Z, Keenan PS, Chen J, Ross JS, Drye EE, et al. Relationship between hospital readmission and mortality rates for patients

- hospitalized with acute myocardial infarction, heart failure, or pneumonia. *Jama*. 2013;309(6):587-93.
3. Canto JG, Rogers WJ, Goldberg RJ, Peterson ED, Wenger NK, Vaccarino V, et al. Association of age and sex with myocardial infarction symptom presentation and in-hospital mortality. *Jama*. 2012;307(8):813-22.
4. Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, et al. Heart disease and stroke statistics—2010 update. *Circulation*. 2010;121(7):e46-e215.
5. Mahmoodi MR, Baneshi MR, Rastegari A. Comparison of conventional risk factors in middle-aged versus elderly diabetic and nondiabetic patients with myocardial infarction: prediction with decision-analytic model. *TherAdvEndocrinolMetab*. 2015;6(6):258-66.
6. Holzmann MJ, Jungner I, Walldius G, Ivert T, Nordqvist T, Ostergren J, et al. Dyslipidemia is a strong predictor of myocardial infarction in subjects with chronic kidney disease. *Ann Med*. 2012;44(3):262-70.
7. Chen SM, Tsai TH, Hang CL, Yip HK, Fang CY, Wu CJ, et al. Endothelial dysfunction in young patients with acute ST-elevation myocardial infarction. *Heart Vessels*. 2011;26(1):2-9.
8. Adhikari CM, Prajapati D, Baniya B, Regmi S, Bogati A, Thapaliya S. Prevalence of Conventional Risk Factors in ST Segment Elevation Myocardial Infarction Patients in ShahidGangalal National Heart Centre, Nepal. *JNMA J Nepal Med Assoc*. 2014;52(195):914-9.
9. Canto JG, Kiefe CI, Rogers WJ, Peterson ED, Frederick PD, French WJ, et al. Atherosclerotic risk factors and their association with hospital mortality among patients with first myocardial infarction (from the National Registry of Myocardial Infarction). *The American journal of cardiology*. 2012;110(9):1256-61.
10. Rosamond WD, Chambless LE, Heiss G, Mosley TH, Coresh J, Whitsel E, et al. Twenty-two year trends in incidence of myocardial infarction, CHD mortality, and case-fatality in four US communities, 1987 to 2008. *Circulation*. 2012:CIRCULATIONAHA. 111.047480.
11. Nabel EG, Braunwald E. A tale of coronary artery disease and myocardial infarction. *New England Journal of Medicine*. 2012;366(1):54-63.
12. Sadowski M, Gasior M, Gierlotka M, Janion M, Poloński L. Gender-related differences in mortality after ST-segment elevation myocardial infarction: a large multicentre national registry. *EuroIntervention: journal of EuroPCR in collaboration with the Working Group on*

- Interventional Cardiology of the European Society of Cardiology. 2011;6(9):1068-72.
13. Yeh RW, Sidney S, Chandra M, Sorel M, Selby JV, Go AS. Population trends in the incidence and outcomes of acute myocardial infarction. *New England Journal of Medicine*. 2010;362(23):2155-65.
 14. Roe MT, Messenger JC, Weintraub WS, Cannon CP, Fonarow GC, Dai D, et al. Treatments, trends, and outcomes of acute myocardial infarction and percutaneous coronary intervention. *Journal of the American College of Cardiology*. 2010;56(4):254-63.
 15. Herrett E, Shah AD, Boggon R, Denaxas S, Smeeth L, van Staa T, et al. Completeness and diagnostic validity of recording acute myocardial infarction events in primary care, hospital care, disease registry, and national mortality records: cohort study. *Bmj*. 2013;346: f2350.
 16. Dabiran S, Khalegi B, Khajehnasiri F. Comparison of elderly and non-elderly: A 24 year study. *Advances in Aging Research*, 4, 13-17.
 17. Gehani A, Al-Hinai A. et al. Association of risk factors with acute myocardial infarction in middle east countries: the INTERHEART Middle East Study. *European Journal of Preventive Cardiology*. 2014, Vol.21(4)400-410.
 18. Alwan A. Prevalence and control of cardiovascular disease. Geneva: WHO, EMRO Technical publications, 1995: 22 [Eastern Mediterranean Series].
 19. Midhet F, Al Mohaimed AR, Sharaf F. Dietary practices, physical activity and health education in Qassim region of Saudi Arabia. *International J. Health Sciences*. 2010; 4: 3-12.
 20. Tunstall-Pedoe H, Morrison C, Woodward M, Fitzpatrick B, Watt G. Sex differences in myocardial infarction and coronary deaths in the Scottish MONICA population of Glasgow 1985 to 1991. *Circulation*. 1996;93(11):1981-92.
 21. Rashed WA et al. Thrombolytic therapy in acute myocardial infarction: experience at a university hospital in Kuwait. *Annals of Saudi Medicine*, 1998, 18:301–304.
 22. Grundy SM et al. Assessment of cardiovascular risk by use of multiple risk factor assessment equations. *Circulation*, 1999,100:1481–1492.
 23. Wilkinson P et al. Comparison of case fatality in South Asian and white patients after acute myocardial infarction: observational study. *British Medical Journal*, 1996, 312:1330–1333.
 24. Hakim JG et al. Acute myocardial infarction in a region of Saudi-Arabia—the Gizan experience. *Saudi Medical Journal*, 1991, 12:392–396.
 25. Manfro WC et al. Acute myocardial infarction. The first manifestation of ischemic heart disease and relation to risk factors. *Arquivos Brasileiros de Cardiologia*, 2002, 78:392–395.
 26. Hebert JR, Kabat GC. Difference in dietary intake associated with smoking status. *European Journal of Clinical Nutrition*, 1990, 44:185–193.
 27. Abdulkarem A, El-Shareif H, Sharif S. Evaluation of risk factors in acute myocardial infarction patients admitted to the coronary care unit, Tripoli Medical Centre, Libya. *Eastern Mediterranean Health Journal*. 2012;18(4):332.

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A study on prevalence of hypertension among high school children in Shivamogga City - a cross sectional study.

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Abstract

Background and objectives: Hypertension in children is an emerging public health issue attracting the attention of medical professionals worldwide. Hence early detection of blood pressure in children is very important to prevent future development of hypertension and its complications in adult life. Therefore an epidemiologic study was conducted with the objectives 1)To estimate the prevalence of pre-hypertension and hypertension among high school children.2)To study the risk factors associated with the hypertension. **Methodology:** Observational cross-sectional study was conducted from July-2014 to June-2015 among high-school children aged 13 to 16 years in urban area of Shivamogga city in Karnataka state. Pre-tested questionnaires were used to collect the data from children. Blood pressure and Anthropometric measurements (height and weight) were recorded as per the WHO guidelines. Average of three readings of blood pressure was considered. A child was said to be having hypertension or pre-hypertension if, systolic and/or diastolic blood pressure greater than or equal to 95th percentile and 90th to below 95th percentile for height, age and sex respectively. **Results:** The total study population comprised of 1200 students aged between 13 – 16 years. The overall prevalence of pre-hypertension was found to be 5% and that of hypertension was 8.58% among study subjects. Prevalence of hypertension was higher among 15 - 16 year children (11.48%) as compared to 13 - 14 year(6.66%). The socio-economic status, BMI status, junk food intake, playing outdoor game, watching TV, playing video/mobile game were found to be significantly associated with hypertension. **Conclusion:** Prevalence of hypertension and pre-hypertension was high among school children aged 13-16 years in Shivamogga city. Obesity, Junk food intake, less Physical activity were the risk factors for childhood hypertension.

Key-words: Hypertension, Pre-hypertension, childhood hypertension, CVD, BMI, Junk food.

Introduction

Hypertension means increased pressure (tension) in arteries. Most of the people think that, hypertension affects only aged people, but it is now apparent that it affects people of all ages including young children. WHO has named Hypertension as a “silent killer” because a person could have it for years without even knowing it.¹It can be a very dangerous if not treated right away and properly.

WHO has reported in "World Health Day 2013" that, globally cardiovascular disease accounts for approximately 17 million deaths in a year, nearly one third of the total. Of these, complications of hypertension

account for 9.4 million deaths worldwide every year. Hypertension is responsible for 45% of deaths due to heart disease.²

Hypertension is a chronic condition and it has a role in the causation of coronary heart disease, stroke and other vascular complications like peripheral vascular disease, renal impairment, retinal haemorrhage and visual impairment.³ In developed countries, hypertension is reported to be the fourth contributor to premature death and seventh in developing countries.⁴ It has been identified as a leading risk factor for mortality and ranked third as a cause of disability- adjusted life-years.⁵ In 2008, worldwide, approximately 40% of adults aged 25 and above had been diagnosed with hypertension; the number

of people with the condition are 1 billion in 2008⁶ and this is predicted to increase to 1.56 billion by 2025.⁷

Hypertension had been considered relatively uncommon in children and adolescents. However, this may be changing primarily because of the influence of the childhood obesity epidemic. Hypertension in children is an emerging public health issue attracting the attention of medical professionals worldwide. Prevalence of hypertension in children is estimated to be 1-2% in developed countries.⁸ Not many studies are done in India, small surveys in school children suggest a prevalence ranging from 2-5%.⁹

The level of risk factors during childhood and adolescence tends to track into the youth and late adulthood also. Thus, children who have higher levels of body weight, blood pressure, blood glucose and cholesterol, will tend to have high level of these parameters during adulthood also.¹⁰ Hence early detection of blood pressure in children is very important to prevent future development of hypertension and its complications in adult life.

In this context, the present study was conducted to estimate the prevalence of Hypertension among high school children and to study the risk factors associated with the Hypertension among school children aged 13-16 years in Shivamogga city.

Materials and Methods

Observational cross-sectional study was conducted among high-school children aged 13 to 16 years in urban area of Shivamogga city in Karnataka state. Study was conducted from 1st July-2014 to 30th June-2015 for a period of 12 months. School children aged 13 to 16 years in the study area were included in the study and children who were absent during data collection even after two visits were excluded from the study. A list of government and private schools was obtained from the Deputy Director of Public Instructions (DDPI) Office Shivamogga. From that list, four schools were selected by using random sampling method. Sample size was calculated on relative precision method by taking prevalence as 5% and by using the following formula: $n = \frac{Z_{1-\alpha/2}^2(1-P)}{P\varepsilon^2}$ Where, $Z_{1-\alpha/2} = 1.96$, $P = 0.05$, $\varepsilon = 0.35$ and sample size was found to be 596. Since, sampling design of the study was cluster random sampling, the sample size was multiplied by Design Effect of 2. Final Sample size was 1192 which was rounded off to 1200 this was achieved by selecting 300 children from randomly selected 4 schools. Ethical clearance was obtained by Institutional Ethics Committee, Shivamogga Institute of Medical Science, Shivamogga

Method of data collection: The study was conducted among school children of aged 13 to 16 years in Shivamogga city. A prior permission was obtained from school principal to conduct the study by explaining the

study protocol. Informed consent was obtained from the parents or guardian.

All the children were interviewed personally using semi structure questionnaire. This questionnaire comprised of the questions regarding socio demographic details, physical activities and diet. Blood pressure and Anthropometric measurements (height and weight) were recorded as per the WHO guidelines. Average of three readings of Blood pressure was considered.

The height measurement scale was fixed to the wall and height was measured without any footwear. The student stood straight with heels, buttocks, back touching the wall and stretching upwards to the fullest extent with arms hanging on the side. The head was aligned so that the lower rim of the orbit and the auditory canal were in the horizontal plane.

Weight was measured by digital weighing machine without any footwear with clothing (school uniform). BMI was calculated and children were identified as overweight if BMI was more than 85th percentile and obese if BMI was more than 95th percentile (IAP Growth Monitoring Guidelines for Children from Birth to 18 Year).¹¹

The complete procedure of BP measurement was explained to children. The BP was measured after a period of quiet for at least 5 minutes so as to decrease the anxiety. The BP was measured in sitting posture with hand resting on examining table with cubital fossa supported at the level of the heart. Mean of three consecutive BP readings at the interval of five minutes was taken.

A child was said to be having hypertension if, systolic and/or diastolic blood pressure was greater than or equal to 95th percentile for height, age and sex and a child was said to be having pre-hypertension if, systolic or diastolic blood pressure were greater than or equal to 90th percentile but less than 95th percentile for height, age and sex.¹²

Statistical analysis: The collected data were coded and the tabulated on Microsoft Excel sheet. Analysis was done by using Epi-Info - 7 software. The χ^2 -test was used to analyse the association between hypertension with various factors.

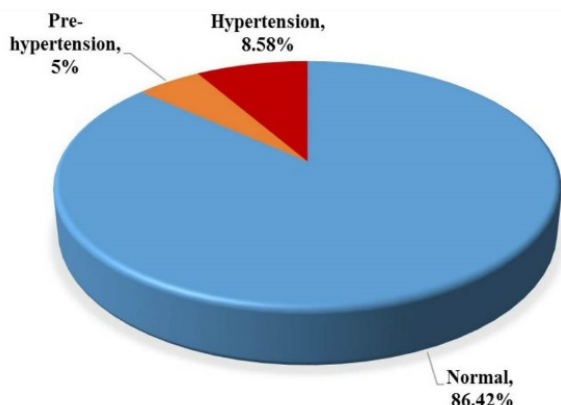
Results

This study was conducted in the urban area of Shivamogga. Four schools were selected randomly from the list of schools available from the DDPI office. The total sample size of the study population comprised of 1192 which was rounded off 1200.

The total study population comprises of 1200 students aged between 13 – 16 years. Among them 629(52.42%) were males and 571(47.58%) were females.

721(60.08%) students fall in to the 13 – 14 years age group and comprising of 50.49% boys and 49.51% girls. 479(39.92%) students were in 15 – 16 years age group and comprising of 55.32% boys and 44.68% girls.

Figure 1: Prevalence of Pre-hypertension and Hypertension.



In the present study out of 1200 students 60(5%) children were found to be pre-hypertensive and 103(8.58%) were found to be hypertensive (Figure 1).

Table 1. Association between Hypertension and Socio-demographic factors.

Variables	Normal	HT	Total	χ^2 Value	p value
Age					
13-14 years	673 (93.34)	48 (6.66)	721 (100)		
15-16 years	424 (88.52)	55 (11.48)	479 (100)	8.53	0.0034
Sex					
Boys	593 (94.28)	36 (5.72)	629 (100)		
Girls	504 (88.27)	67 (11.73)	571 (100)	13.7	<0.001

In this study prevalence of hypertension was more among 15 – 16 years age group and Girls. This shows that there is a association between hypertension and age of the students and sex. This association was statistical significant at $p < 0.05$ (Table 1).

The prevalence of Hypertension was more in the students with BMI status $>85^{\text{th}}$ percentile, intake of Junk food more than 3 times in a week, playing outdoor games ≤ 2 hour in a day, watching TV >2 hours in a day and playing Video/Mobile game >2 hours in a day and showed statistically significant with Hypertension at $p < 0.05$ (Table 2).

Discussion

The present descriptive cross - sectional study was conducted among 1200 school children in urban area of Shivamogga, Karnataka. In our study the prevalence of pre hypertension and hypertension among school children aged 13 - 16 years was found to be 5% and 8.6% respectively. But review of literature suggests that variation in the prevalence of hypertension was due to

place of the study, urbanisation and economic status of the country.

Table 2. Association between Hypertension and various risk factors.

Variables	Normal	HT	Total	χ^2 Value	p value
BMI status					
$\leq 85^{\text{th}}$ percentile	958 (94.20)	59 (5.80)	1017 (100)		
$>85^{\text{th}}$ percentile	139 (75.96)	44 (24.04)	183 (100)	65.7	<0.001
Diet					
Vegetarian	272 (92.20)	23 (7.80)	295 (100)		
Mixed	825 (91.16)	80 (8.84)	905 (100)	0.30	0.57
Junk food intake					
≤ 3 times in week	758 (95.83)	33 (4.17)	791 (100)		
>3 times in week	339 (82.89)	70 (17.11)	409 (100)	57.5	<0.001
Hours of playing outdoor games					
≤ 2 hour in a day	336 (77.78)	66 (15.28)	432 (100)		
>2 hour in a day	731 (95.18)	37 (4.82)	768 (100)	38.5	<0.001
Hours of TV watching per day.					
≤ 2 hour in a day	911 (92.86)	70 (7.14)	981 (100)		
>2 hour in a day	186 (84.93)	33 (15.07)	219 (100)	14.3	<0.001
Hours of playing Video/Mobile games per day.					
≤ 2 hour in a day	724 (94.27)	44 (5.73)	768 (100)		
>2 hour in a day	373 (86.34)	59 (13.66)	432 (100)	22.1	<0.001

In our study prevalence of Hypertension was 8.6% which was comparable with Studies done in in Pondicherry 8.5%,¹⁴ in Western India 6.8%,¹⁶ in Congo 10.1%,¹³ and in Seychelles 7.8%.¹⁵ Low prevalence of Hypertension was reported in Bijapur, Karnataka 4%,¹⁹ Sudan 4.9%,¹⁷ and in Egypt 4%,¹⁸ and High prevalence of hypertension was reported in Tamilnadu 20.1%²⁰ and in South Africa 29.4%.²¹ These differences in the prevalence were due to demographic, social and economic transition of developing and third world countries..

In the present study prevalence of hypertension was higher in the age group 15 - 16 years (11.48%) and it increased with increasing age. Study done by Jasmin S Sunder et al on hypertension in school children showed that the prevalence of hypertension was increasing with the age among children. It was lowest among students of VIII standard than among X, XI and XII students respectively.²⁰ A study done in rural area of Wardhastates that Mean SBP and DBP level was found to be increasing from 6 years to 16 years.²² Studies done by Pushpa Krishna et al,²³ Anisa M Durrani et al.²⁴ and Raja Danashekaran and Vinoth R²⁵ showed that mean blood pressure increased significantly with age.

In the present study prevalence of Hypertension was more among girls (11.73%) than boys(5.72%). Study done by Yuvaraj BY in Chitradurga²⁶ showed that prevalence of hypertension to be more in females(4.2%) compared to males(1.3%). But some studies conducted in Tamilnadu²⁰ and Western India¹⁶ showed prevalence of Hypertension to be more in the boys as compared to girls.

In our study the prevalence of hypertension was 24.04% among children with the BMI Status >85th percentile and 5.80% in children with BMI Status ≤85th percentile. A study done by Jasmine S Sunder²⁰ and Andriska J et al.²¹ showed that the prevalence of hypertension was high among obese individuals compared with lean children.

In the present study frequent junk food (fast food) intake showed statistically significant association with hypertension. This could be due to the ingredients involved in the preparation of junk food. These ingredients usually contain more fat and calorie but less nutritive value. The study conducted by Kotian MS²⁷ also showed statistical significant association between daily intake of chocolate and prevalence of overweight among adolescents.

In the present study there was significant association between hypertension and hours of TV watching. Prevalence of Hypertension was 15.07% in children who watch TV more than 2 hours in a day. This is probably because of sitting ideally in front of TV which results in decreased catabolism and increased adipose tissue accumulation. Another reason is that, the children who watch TV for longer hours tend to have more food while watching TV which results in weight gain and obesity. The results were comparable with the study done by Perrie E. Pardee²⁸ where he discussed that the odds of hypertension for children. Watching TV for more than 4 hours was 3.3 times greater than the children watching TV for less than 2 hours.

In our study prevalence of hypertension was more among the children who played video/mobile game for >2 hour. This could be due the more stress which occurs during playing video/mobile games.

The prevalence of hypertension was more in the children who played outdoor games for less than 2 hours in a day. In contrast, a study done by Jasmine S Sunder et al.²⁰ did not show any significant association between the physical activity and hypertension. Similar findings were found in the study done by Soundarssanane MB et al.¹⁴ and Raja D.

Conclusion: The result of our study concludes that there was high prevalence of hypertension among school children aged 13-16 years in Shivamogga city. Our study confirms the variations in BP level as per age and gender. Obesity, junk food intake and less physical activity were the risk factors for childhood hypertension.

Recommendations: There is a need for implementation of a comprehensive CVD prevention program in schools which include health education of eating right types of foods of nutritious nature with due emphasis on sports and physical activity. Routine blood pressure measurements should be taken in school children to improve the detection, prevention and treatment of hypertension.

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References

1. World Health Organization. Heart Beat: the rhythm of health report on World Health Day. 1991 Apr 7. Geneva: World Health Organization; 1992.
2. World Health Organisation. A global brief on hypertension: World Health Day. Geneva: World Health Organization; 2013;1-40.
3. Park K. Preventive and social medicine. 24th ed. Jabalpur: M/s Banarsidas Bhanot; 2017;391-95.
4. Deepa R, Shanthirani CS, Pradeepa R, Mohan V. Is the 'rule of halves' in hypertension still valid?—evidence from the Chennai urban population study. *J Assoc Physicians India.* 2003;51:153-7.
5. Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ. Comparative risk assessment collaborating group: selected major risk factors and global and regional burden of disease. *Lancet.* 2002;360:1347-60.
6. World Health Organization. Global status report on non-communicable diseases 2010. Geneva: World Health Organization; 2011;1-164.
7. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet.* 2005;365:217-23.
8. Muntner P, He J, Cutler JA, Wildman RP, Whelton BK. Trends in blood pressure among children and adolescents. *JAMA.* 2004;291:2107-2113.
9. Mohan B, Kumar N, Aslam N, Rangbulla A, Kumbkarni S, Sood NK, et al. Prevalence of sustained hypertension and obesity in urban and rural school going children in Ludhiana. *Indian Heart J.* 2004;56:310-314.
10. Bhalwar R, Vaidya R, Tilak R, Gupta R, Kunte R. Text book of public health and community medicine. Pune: Department of community medicine AFMC; 2009;1216-19.

11. Khadilkar VV, Khadilkar AV, Choudhury P, Agrawal KN, Ugra D, Shah NK. IAP growth monitoring guidelines for children from birth to 18 years. *Indian Pediatr.* 2007;44:187–97.
12. Fourth report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents: national high blood pressure education programme: working group on high blood pressure in children and adolescents. *Pediatrics.* 2004;114:555-75.
13. Mbolla BF et al. Prehypertension and hypertension among schoolchildren in Brazzaville, Congo. *Int J Hypertens.* 2014.
14. Soudarssanane MB, Karthigeyan M, Stephen S, Sahai A. Key Predictors of high blood pressure and hypertension among adolescents: a simple prescription for prevention. *Indian J Community Med.* 2006;31:164-69.
15. Chiolero A, Paradis G, Madeleine G, Hanley JA, Paccaud F, Bovet P. Discordant secular trends in elevated blood pressure and obesity in children and adolescents in a rapidly developing country. *Circulation.* 2009;119(4): 558–565.
16. Buch N, Goyal JP, Kumar N, Parmar I, Shah VB, Charan J. Prevalence of hypertension in school going children of Surat city, Western India. *J Cardiovasc Dis Res.* 2011 Oct-Dec;2(4):228–232.
17. Salman Z, Kirk GD, Deboer MD. High rate of obesity associated hypertension among primary schoolchildren in Sudan. *Int J Hypertens.* 2011;1-5.
18. Abolfotouh MA, Sallam SA, Mohammed MS, Loutfy AA, Hasab AA. Prevalence of elevated blood pressure and association with obesity in Egyptian school adolescents. *Int J Hypertens.* 2011;1-8.
19. Baradol RV, Ranagol A, Patil SV. Hypertension as an emerging health problem amongst schoolchildren and adolescents. *Int J Med Res Health Sci.* 2013;2(4):941-8.
20. Sundar JS, Adaikalam JM, Parameswari S, SV, Kalpana S, Shantharam D. Prevalence and determinants of hypertension among urban school children in the age group of 13- 17 years in, Chennai, Tamilnadu. *IOSR Journal of Dental and Medical Science.* 2013;8(3):14-20.
21. Andriska J, Gombik M, Breyer H, Tarr A. Hypertension in children and adolescents: Results of a long term follow up study. *Clin Exper Theory Practice.* 1986;8:567-9.
22. Patil RR, Garg BS. Prevalence of hypertension and variation in blood pressure among school children in rural area of Wardha. *Indian J Public Health.* 2014;58:78-83.
23. Krishna P, MPK, Desai N, KT. Blood pressure reference tables for children and adolescents of Karnataka. *Indian pediatr.* 2006;43:491-501.
24. Durrani AM, Waseem F. Blood pressure distribution and its relation to anthropometric measurements among school children in Aligarh. *Indian J Public Health.* 2011;55:121-4.
25. Danasekaran R, R V. A study on relation between BMI and hypertension among adolescents in Kancheepuram district, Tamil Nadu. *International Journal of Applied Research.* 2015;1(2):08-12.
26. Yuvaraj BY, Nagendragowda MR, Rajeev KH, Prahantkumar JH, Ujjanappa S, Shreyas M. A study on hypertension in school children of chitradurg district Karnataka. *Global Journal of Medical research.* 2014;14(1):1-6.
27. Kotian M S, Kumar S G, Kotian SS. Prevalence and determinants of overweight and obesity among adolescent school children of South Karnataka, India. *Indian J Community Med* 2010;35:176-8.
28. Pardee PE, Norman GJ, Lustig RH, Preud'homme D, Schwimmer JB. Television viewing and hypertension in obese children. *Am J Prev Med.* 2007;33(6):439–443.
29. Raja D, R MI. A cross sectional study on the prevalence of hypertension among adolescent school students in rural areas of Kancheepuram district, Tamilnadu. *Indian Journal of Rural Health Care.* 2012;1(2):133-9.

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A study on the prevalence of depression and its associated factors among the elderly in Kancheepuram district, South India.Joy Patricia Pushparani¹, S.Chitrasena²,R.Ramasubramanian³.

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Abstract

Background: The proportion of the elderly persons is increasing, most of the people lives in rural areas and depression among the elderly impairs the functioning in daily life. As people age, they experience multiple chronic health problems. Health problems when compounded with depression, worsens the clinical outcome still further. **Objectives:**To assess the prevalence of depression and its associated factors among the elderly. **Materials and methods:** This is a part of a larger study, conducted as a community based cross sectional study on nutrition and health status of the elderly. Data was collected on an interview schedule in the local language among 496 the elderly persons (60 years and above) selected by multi stage sampling technique from Kancheepuram District in Tamil Nadu using semi - structured questionnaire. Nutritional assessment done using Mini Nutritional Assessment (MNA) scale, hemoglobin estimation by Cyano-methemoglobin method and depression scale using Geriatric Depression Scale – Short Form (15 questions). **Results:**Nearly half (47.8%) of the elderly were depressed. It was found that depression is high in labourers, poorly educated, females, those living alone, without their spouse, financially dependent and lower socio economic status and with co – morbidities, anemia and malnutrition. Multi variate analysis revealed a significant association of depression in the elderly with lower socio economic status (OR = 1.97), those not living with their spouse (OR= 4.5), who were malnourished or at risk of malnutrition (OR = 5.8) and who had co-morbidities including anemia and Malnutrition (OR = 1.79). **Conclusion:** There is an urgent need to address depression among the elderly. Mental health services to the elderly should be incorporated in the screening services rendered in primary health care settings for a proper care and support to improve their quality of life.

Key-words:Anemia, Depression, Elderly, Geriatric Depression Scale, MNA.

Introduction

Mental health is as important as physical health. Mental health issues are on the rise among all ages and across countries. The World Health Day campaign theme for the year 2017 is “**Depression: Let’s talk**” as depression is the most common psychiatric condition nowadays. In India, the National Mental Health Survey 2015-16 revealed that around 15% of Indians have one or more mental health issues which needs professional help and one in 20 Indians suffers from depression.(1)

The World Health Organization identified three groups that are disproportionately affected: adolescents and young adults, women of childbearing age (particularly following childbirth) and older adults (over 60s).(1)The WHO’s focus is not only on demographic vulnerability, but also on geographic and financial vulnerability.

Depression is a major public health problem which is common among the elderly for the following reasons:

The proportion of the elderly persons who are most vulnerable is increasing worldwide (demographic transition) due to the reduction in fertility rates and mortality rates through increased health care facilities which led to increased life span and also due to literacy, urbanization and industrialization.(2)

India is one among the graying nations as it has 8.14% of its population above 60 years of life and projected to be 19% in 2050(3). In India, about 80% of the elderly lives in rural areas which makes the service delivery difficult. Around 30% of the elderly people are in below poverty line.(3) Thirty percent of men and fifteen percent of women aged 60 years and above are in active labour force because of less awareness to plan for retirement savings and less coverage of public social security schemes.(4)

As people age, they experience several chronic health problems at the same time. Physiological health problems directly affects the mental wellbeing of the elderly and also the elderly have negative perceptions of their health which in turn exerts a negative effect on their quality of life.(5) These challenges also pose a threat to health care systems, care givers and also to country's economic growth.

Furthermore, the elderly ages are compounded with co-morbid conditions, especially the non – communicable diseases that needs long term care and support which increases the proportion of depression in this age group. Common conditions in older age include hypertension, back and neck pain, osteoarthritis, diabetes, chronic obstructive pulmonary disease, cataract and refractive error and anemia.(6)

Apart from diabetes and cardio vascular diseases, anemia is an important co-morbid condition and always posing a major public health problem across all ages in our nation. Especially anemia among the elderly is also associated with a wide range of complication, including increased risk of mortality and morbidities like cardiovascular disease, cognitive dysfunction, reduced bone density, malnutrition and longer periods of hospitalization for elective procedures(7) and all these health problems when compounded with depression, worsens even more the clinical outcome.

Depression among the elderly impairs the functioning in daily life. Unipolar depression accounts for 5.7% of YLDs among over 60 year olds. Depression increases the perception of poor health, the utilization of medical services and health care costs. The primary health care settings have to be improvised to diagnose and treat depression among the elderly.(8)

If the quality of added years of life has to be maintained, the physical and mental health of the elderly must be taken care of and the country's health system should adapt technology related changes in health care, strengthening of social security systems to keep in pace of growing the elderly population are needed.(9) This study focus on the prevalence of depression among the elderly and the associated factors of depression like anemia, nutritional status, co-morbidities etc.

Methodology

This is a part of a larger study which was conducted as a comparative community based cross sectional study on nutritional and health status of the elderly. The sample size calculated for the main study was 243 in each rural and urban areas which was based on few studies(10)(11). The study group was 496 the elderly persons (60 years and above) selected from rural and urban areas of Kancheepuram District in Tamil Nadu and the study was conducted from November 2015 to August 2016 with a period of field study from April 2016 to July 2016.

Data collection was done in the study area after obtaining prior permission from Institutional Ethics Committee, Madras Medical College and from The Deputy Director of Health Services (DDHS), Kancheepuram.

Study procedure

The villages where HSC (Health Sub Center) are located and the electoral wards in urban areas of Kancheepuram District were enlisted. There were 173 HSCs and 45 electoral wards, among which three HSCs and 3 electoral wards were selected by simple random sampling technique and the individuals were selected from the household list available with the health nurse. The elderly who are resident and willing were enrolled in the study. Those not available on two consecutive visits and critically ill were excluded. Data was collected on an interview schedule in the local language and the questionnaire had socio – demographic details, history of co-morbid conditions, anthropometry, nutritional assessment using Mini Nutritional Assessment (MNA) scale, Hemoglobin estimation by Cyano-methemoglobin method and depression scale. Each participant was given a brief introduction about the study and informed written consent was obtained from all participants (In illiterate elders, a thumbprint was taken in front of witnesses. After completing the questions and viewed the health records at their homes, anthropometry were measured and two milliliters of blood was drawn to estimate hemoglobin in the sub center (Rural areas) and ICDS centers (Urban areas) where emergency medicines were kept ready.

The details of co-morbid conditions were elicited from the history and the medical records available. Anthropometric tools: weighing machine (Weight measurement), stadiometer (Height measurement), measuring tape (Mid upper arm circumference & Calf circumference measurement) were used.

Nutritional assessment was done using Body Mass Index (BMI) and with Mini Nutritional Assessment (MNA) of Nestle Nutrition Institute which is a validated tool. MNA classification is based on scores: Scores of 24 – 30 are considered Normal; 17 – 23.5 indicate at risk of malnutrition; Less than 17 points indicate Malnutrition. The questions were probed using MNA guide (12). The presence of depression was assessed using Geriatric Depression Scale – Short Form (15 questions) and was graded as per the scores provided(13). The Tamil version by Cynthia Swarnalatha Srikesavan of the University of Manitoba, Canada was used(14). The GDS was found to have a 92% sensitivity and 89% specificity when evaluated against diagnostic criteria(15). Hemoglobin was estimated by cyano-methemoglobin method using drabkin's solution whose quality control was ensured by analyzing standard sample before checking for the test samples using semi auto-analyzer by a lab technician with proper universal precautions. Hemoglobin levels to diagnose anemia and the anemia cut-offs defining mild, moderate and severe anemia were according to the WHO classification.(16) Biomedical waste was segregated at the

point of production and disposed through respective Primary Health Centers and Urban Health Centers.

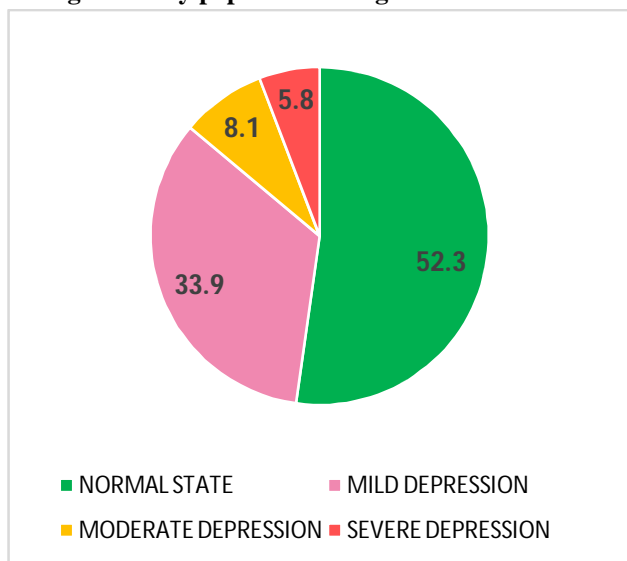
Data analysis: The responses were verified twice, entered and analyzed using IBM SPSS version 16.0. The descriptive and inferential statistics of the responses to the questions were calculated. A two tailed p value of <0.05 was considered as statistically significant.

Results

The study population consisted of totally 496 the elderly people, out of which 44.8% (222 participants) were males and 55.2% (274 participants) were females. Around 49.2% belonged to urban area and 50.8% resides in rural area. Among the study population, the minimum age was 60 years and maximum was 92 years with a Mean Age (± S.D.) of 65.41 (± 5.77) years.

Distribution of depression among the study population using the GDS.: Among 496 the elderly, 47.8% (237 participants) were depressed. According to Geriatric Depression Scale, depression is classified into mild, moderate and severe and its distribution is shown in figure1.

Figure.1. Pie chart showing Distribution of depression among the study population using the GDS.



Distribution of Depression and Socio – demographic variables.

The distribution of depression and its association with the socio demographic variables viz., age, gender, residence, educational status, occupational status, marital status and type of family are depicted in table 1 and the economic and socio-economic status is shown in table 2.

Association between Depression and Co-morbidities

The association between depression and the presence of one or more co-morbidities is shown in the figure 2. The depression is more among the elderly with co-morbidities (52.4%) when compared with the elderly persons without any co-morbid conditions (39.5%) and the difference is statistically significant (p=0.006).

Figure.2. Association between Depression and Co-morbidities

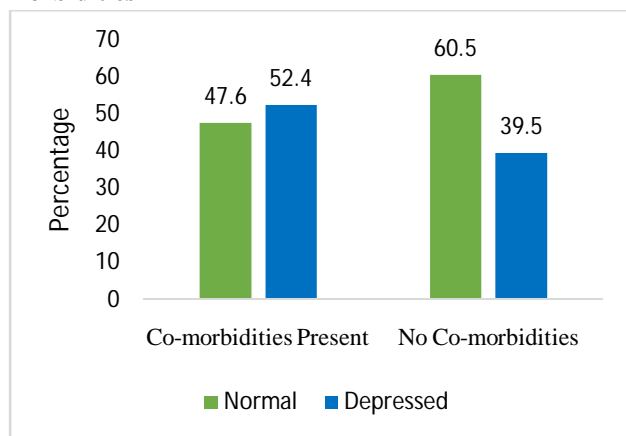
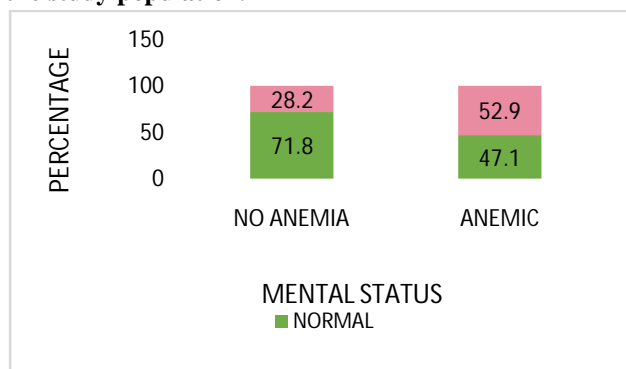
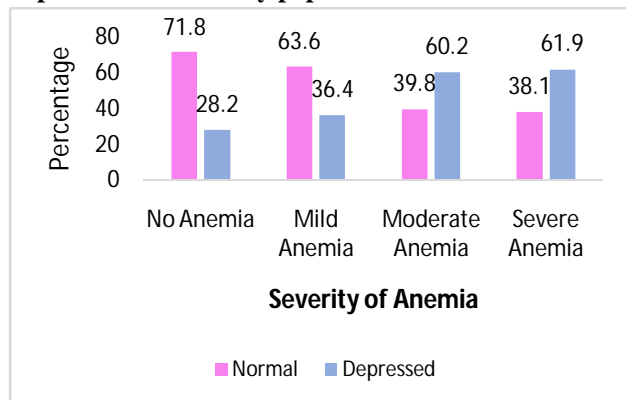


Figure.3. Distribution of Anemia and Depression in the study population.



Chi square = 20.070, df = 1, p = 0.001

Figure.4. Distribution of Severity of Anemia and Depression in the study population.



Association between Depression and Nutritional status among the study participants

The association between the nutritional status and depression among the participants is shown in the table 3. The nutritional status is assessed by both BMI as well as using MNA scale.

According to BMI, the proportion of depression is high among the elderly who were underweight when compared to the elderly people with normal weight. According to Mini Nutrition Assessment scale, depression is high among the elderly who were malnourished and at risk of malnutrition when compared to the elderly with normal nutrition status and is statistically significant.

Table.1. Distribution of Depression and Socio – demographic variables.

Criteria	Depressed N=237 (%)	Normal state N=259 (%)	Total	P value by χ^2 test	
Age					
60-69 Years	184 (45.3)	222 (54.7)	406	$\chi^2 = 6.250, df = 2, p = 0.044$	
70-79 Years	43 (61.4)	27 (38.6)	70		
80 and above	10 (50)	10 (50)	20		
Gender					
Male	86 (38.7)	136 (61.3)	232	$\chi^2 = 13.173, df = 1, p = 0.001$	
Female	151 (55.1)	123 (44.9)	274		
Residence					
Rural	130 (51.6)	122 (48.4)	252	$\chi^2 = 2.973, df = 1, p = 0.085$	
Urban	107 (43.9)	137 (56.1)	244		
Educational Status					
No formal education	108 (58.7)	76 (41.3)	184	$\chi^2 = 30.233, df = 4, p = 0.001$	
Primary school education	63 (50)	63 (50)	126		
Secondary education	34 (50)	34 (50)	68		
Higher secondary education	22 (30.6)	50 (69.4)	72		
Diploma / Degree	10 (21.7)	36 (78.3)	46		
Occupational Status					
Not working	151 (54.5)	126 (45.5)	277	Fisher exact p=0.001	
Unskilled worker	56 (54.4)	47 (45.6)	103		
Semi-skilled worker	10 (41.7)	14 (58.3)	24		
Skilled worker	1 (8.3)	11 (91.7)	12		
Shop/ Land owner	19 (24.7)	58 (75.3)	77		
Professional	0 (0)	3 (100)	3		
Marital status					
Currently married	116 (34.7)	218 (65.3)	334		$\chi^2 = 69.817, df = 1, p = 0.001$
Widow/Widower/ Separated/ Single	121 (74.7)	41 (25.3)	162		
Type of Family					
Nuclear family	52 (32.7)	107 (67.3)	159	$\chi^2 = 37.582, df = 2, p = 0.001$	
Joint/Extended family	136 (49.6)	138 (50.4)	274		
Living Alone	49 (77.8)	14 (22.2)	63		

Distribution of Depression and Anemia in the study population.:

The association between anemia and depression among the participants is shown in the figure 3 and the association between the severity of anemia and depression is depicted in the figure 4. Among the elderly persons with anemia, 52.9% were depressed when compared to the elderly who were having normal hemoglobin level (28.2%). The proportion of depression increases with anemia and the difference is statistically significant (p=0.001).

Table.2. Distribution of Depression and Socio – economic status.

Criteria	Depressed (n=237)	Normal state (n=259)	Total	P value by χ^2 test
Economic Status				
Independent	98 (37.8)	161 (62.2)	259	$\chi^2 = 26.701, df = 2, p = 0.001$
Dependent on Others	121 (56.3)	94 (43.7)	215	
Dependent on OAP*	18 (81.8)	4 (18.2)	22	
Socio-Economic Status				
Upper class	29 (29.6)	69 (70.4)	98	$\chi^2 = 28.538, df = 4, p = 0.001$
Upper middle class	32 (38.6)	51 (61.4)	83	
Middle class	53 (49.1)	55 (50.9)	108	
Lower middle class	94 (57.3)	70 (42.7)	164	
Lower class	29 (67.4)	14 (32.6)	43	

*OAP - Old Age Pension under Indira Gandhi National Old Age Pension Scheme.

Table.3. Distribution of Depression and Nutritional status.

Criteria	Depressed (n=237)	Normal state (n=259)	Total	P value by χ^2 test
Body Mass Index				
Underweight	20 (74.1)	7 (25.9)	27	$\chi^2 = 8.040, df = 2, p = 0.018$
Normal weight	125 (47)	141 (53)	266	
Overweight/Obese	92 (45.3)	111 (54.7)	203	
Nutritional status using MNA (Mini Nutrition Assessment) scale				
Normal Nutritional status	89 (29.4)	214 (70.6)	303	Fisher exact p=0.001
At risk of Malnutrition	140 (76.1)	44 (23.9)	184	
Malnourished	8 (88.9)	1 (11.1)	9	

On comparing the depression with the severity of anemia, the proportion of depression increases when the severity of anemia increases and is high among the elderly with severe (61.9%) and moderate anemia (60.2%) when compared to mild anemia (36.4%) and people with normal hemoglobin levels (28.2%).

Multi variate analysis

In Logistic regression, the individuals were divided into two groups – Depressed and The elderly with normal mental health status. After adjusting for other factors it revealed that the risk of developing depression depends on the elderly living alone (OR 4.52 times, CI – 2.84 to 7.19), belonging to lower socio economic status (OR 1.97 times, CI – 1.22 to 3.18), malnourished or at risk of developing malnutrition (OR 5.8 times, CI – 3.69 to 9.13), presence of co-morbid conditions (OR 1.79 times, CI – 1.13 to 2.82) shown in table 4.

Table 4:Independent risk factors for the risk of developing depression among the elderly.

Variables	B	S.E	Wald	df	Sig	Exp(B)	95% C.I for Exp(B)	
							Lower	Upper
Marital status	1.508	0.237	40.38	1	0.001	4.517	2.837	7.192
Socio – economic status	0.679	0.244	7.772	1	0.005	1.972	1.223	3.178
Nutritional status (MNA)	1.758	0.231	57.87	1	0.001	5.803	3.689	9.129
Co-morbidities	0.58	0.234	6.153	1	0.013	1.786	1.129	2.824
Constant	-2.05	0.287	53.12	1	0.001	0.129		

Discussion

In this community based study, the prevalence of depression among the elderly was 47.8% which is supported by few studies (8,17). The prevalence of depression was high in a study done in north India (61.4%) which is a hospital based study(18)and also in a kanchipuram district study (19)done in an old age home. The proportion of mild, moderate and severe depression were 33.9%, 8.1% and 5.8% respectively.

The depression is high among females than male the elderly and is supported by the studies done in our country(18,20)and also in various countries(17,21)

Among the social factors, the elderly with no formal education or having lower educational status compared to the elderly with high school, diploma/degree education, the elderly who are not working or working as laborers, lower socio economic status compared to upper class, people depending only on government old age pension scheme as financial assistance, single/ widow / widower compared to currently married and living with spouse, living alone were significantly associated with depression. This implies that depression among the elderly depends on multiple social factors and few factors were supported by some studies.(17,22,23)

Depression is significantly associated with the presence of co-morbid conditions (like diabetes, hypertension, anemia, malnutrition etc.,) and is corroborated by an Indian study.(22)Depression is also significantly associated with the nutritional status of the elderly. According to BMI, the depression is high among the elderly who were underweight and according to MNA scale, the depression is high among malnourished (88.9%) and among the elderly at risk of malnutrition (76.1%) when compared to the elderly who were having normal nutritional status and is corroborated with some studies.(21,24,25)Depression is significantly associated with the presence of anemia among the elderly and is supported by a study done in Chianti(26) and in Sao Paulo (27)As the severity of anemia increases, the proportion of depression also increases from 36.4% in the elderly with mild anemia to 61.9% in the elderly with severe anemia.

Binary logistic regression analysis showed that the increase in the burden of depression is significantly associated with lower socio economic status,the elderly who were widow/widower/ separated compared to

currently married, the elderly who are malnourished or at risk of malnutrition and the presence of co-morbidities.

The adjusted odds ratio for developing depression among the elderly due to their nutritional status is 5.8 times higher among those who were malnourished or at risk of malnutrition (95%CI – 3.689 – 9.129), 4.5 times higher chance of developing depression among the elderlywho were widow/widower/separated (95%CI - 2.837 – 7.192), belonging to lower Socio economic status is having two times higher risk of developing depression (95%CI - 1.223 – 3.178) andthe presence of co-morbidities is having 1.8 times higher chance of developing depression (95%CI - 1.129 - 2.824).

Conclusion

In our community based study, nearly half of the elderly were depressed. There was a significant association between depression in the elderly and lower socio economic status, poor nutritional status, presence of co-morbidities like diabetes, cardio vascular diseases, among the elderly currently not living with their spouse and have a significant negative effect on the mental health status of the elderly.

These indicates an urgent need of comprehensive screening for the elderly along with mental health services and health education in the primary health care settings, with proper counselling to the elderly as well as to their care givers for a good care and support along with rehabilitative services.

Limitations of the study

Co- morbidities were self – reported or medical report based, hence the morbidity profile of the study population may have been under estimated. Participants may feign to give the real picture of their health related history so as to project them a good or bad image over their health pattern. This may lead to a possibility of bias in the study. Anemia among depressed is high but it's a chicken-and-egg phenomenon which could not be explained in this study.

Recommendations

Screening for Depression is mandatory for all the elderly and this can be added in National Programme for prevention of cardio vascular diseases, diabetes, cancer

and stroke (NPCDCS) as depression is a major determinant of quality of life in the elderly.

As depression is high among elders, proper counselling should be given before health education to improve the interaction at the primary health care level. Geriatric health care melas can be conducted to render special care for the elderly and health education should be given to the elderly about lifestyle modification (Physical activity, healthy diet) and to the care givers especially through ASHAs and Outreach services.

Financial independency and autonomy should be ensured to the elderly by the policy makers through social security schemes, employment opportunities and special health insurance coverage for in-patient, out-patient as well as for periodic screening procedures to reduce health inequities.

The elderly welfare societies can be started at the panchayat level to know their felt needs and also utilizing their experiences and knowledge by involving them in village administration will help to preserve their mental health and social interaction. In the same way, the elderly people should be attached with the day care centers which will benefit in both ways.

Further analytical studies are needed to find out the direct or indirect association of anemia and depression. Interventional studies are needed to analyze the effect of counselling, health education and to formulate treatment guidelines for anemia among the elderly to improve the quality of life among the elderly.

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References

1. World Health Organization. World Health Day 2017. Depression: Let's talk. South East Asia Regional Organization [Internet]. World Health Organization, South-East Asia Regional Office; 2017 [cited 2017 Jun 21]; Available from: http://www.searo.who.int/entity/world_health_day/2017/en/
2. World Health Organization. Ageing and health [Internet]. Fact sheet N°404. World Health Organization; 2015 [cited 2016 Sep 25]. Available from: <http://www.who.int/mediacentre/factsheets/fs404/en/>
3. Government of India. Operational Guidelines for NPHCE :: Ministry of Health and Family Welfare [Internet]. p. 53. Available from: <http://mohfw.nic.in/showfile.php?lid=1403>
4. United Nations, Department of Economic and

5. Social Affairs PD (2015). World Population Ageing; 2015 (ST/ESA/SER.A/390). World Population Ageing 2015 [Internet]. 2015 [cited 2016 Sep 25]. Available from: http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf
6. Ashwini Morab, Yadav, V.S. Pushpa Khadi and Havaldar, Y.N. Relationship between Mental Health and physical health among Elderly. International Journal of Current Research; 2016[cited 2017 Mar 3];8(06):32366-32369.Available from:<http://www.journalcra.com/sites/default/files/15303.pdf>.
7. Lena A, Ashok K, Padma M, Kamath V, Kamath A. Health and Social Problems of the Elderly: A Cross-Sectional Study in Udupi Taluk, Karnataka. Vol. 34, Indian Journal of Community Medicine : Official Publication of Indian Association of Preventive & Social Medicine. India; 2009. p. 131–4.
8. Eisenstaedt R, Penninx BW, Woodman RC. Anemia in the elderly: current understanding and emerging concepts. Blood Rev. Scotland; 2006 Jul;20(4):213–26.
9. WHO | Mental health and older adults [Internet]. WHO. World Health Organization; 2016 [cited 2017 Mar 1]. Available from: <http://www.who.int/mediacentre/factsheets/fs381/en/>
10. United Nations, Department of Economic and Social Affairs. Population ageing and sustainable development [Internet]. 2015 [cited 2017 Jul 10]. Available from: http://www.un.org/en/development/desa/population/publications/pdf/popfacts/PopFacts_2014-4Rev1.pdf.
11. Paul SS, Abraham VJ. How healthy is our geriatric population? a community-based cross-sectional study. J Fam Med Prim Care. India: Medknow Publications & Media Pvt Ltd; 2015;4(2):221–5.
12. AlokParekh MPDV. Study of Anaemia in Surat, Western India. Natl J Med Res. 2012;2(3):369–71.
13. Nestlé Nutrition Institute - MNA® Elderly - MNA® User Guide [Internet]. Available from: http://www.mna-elderly.com/user_guide.html
14. Geriatric Depression Scale Short Form (GDS-SF) | Psych Congress Network [Internet]. Available from: <http://www.psychcongress.com/saundras-corner/scales-screeners/depression/geriatric-depression-scale-short-form-gds-sf>
15. Sheikh JI, Yesavage JA. Geriatric Depression Scale (GDS): Recent evidence and development of a shorter version. Clinical Gerontology: A Guide to Assessment and Intervention 165-173, NY: The Haworth Press, 1986.[Internet].

- Available from: <https://web.stanford.edu/~yesavage/GDS.html>
15. The Geriatric Depression Scale (GDS) | ConsultGeri [Internet]. Available from: <https://consultgeri.org/try-this/general-assessment/issue-4>
 16. WHO | Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. WHO [Internet]. World Health Organization; 2014 [cited 2016 Sep 25]; Available from: <http://www.who.int/vmnis/indicators/haemoglobin/en/>
 17. Bhamani MA, Karim MS, Khan MM. Depression in the elderly in Karachi, Pakistan: a cross sectional study. BMC Psychiatry [Internet]. BioMed Central; 2013 Jul 3 [cited 2017 Jan 2];13:181. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23819509>
 18. Akhtar H, Khan AM, Vaidhyanathan KV, Chhabra P, Kannan AT. Socio-demographic Predictors of Depression among the Elderly Patients Attending Out Patient Departments of a Tertiary Hospital in North India. Int J Prev Med [Internet]. Medknow Publications; 2013 Aug [cited 2017 Mar 3];4(8):971–5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24049626>
 19. Ramamurthy G, Danasu, Tamilselvi P. A study to assess the prevalence of depression among elderly residing in selected old age home, Kancheepuram District, Tamil Nadu, 2015. Asian J Nurs Educ Res [Internet]. 2015 [cited 2017 Mar 3];5(3):381. Available from: <http://www.indianjournals.com/ijor.aspx?target=ijor:ajner&volume=5&issue=3&article=015>
 20. Sathyanath M S, Kundapur R, Bhat U S, Kiran NU. Proportion of depression among the elderly population in a rural health care setting. J Clin Diagn Res [Internet]. JCDR Research & Publications Private Limited; 2014 Jan [cited 2017 Feb 21];8(1):137–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24596745>
 21. Ahmadi SM, Mohammadi MR, Mostafavi S-A, Keshavarzi S, Kooshesh S-M-A, Joulaei H, et al. Dependence of the geriatric depression on nutritional status and anthropometric indices in elderly population. Iran J Psychiatry [Internet]. Tehran University of Medical Sciences; 2013 Jun [cited 2017 Jan 2];8(2):92–6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24130608>
 22. Akhtar H, Khan AM, Vaidhyanathan KV, Chhabra P, Kannan AT. Socio-demographic Predictors of Depression among the Elderly Patients Attending Out Patient Departments of a Tertiary Hospital in North India. Int J Prev Med [Internet]. Medknow Publications; 2013 Aug [cited 2017 Jan 2];4(8):971–5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24049626>
 23. Javed S. Role of Sociocultural Factors in Depression among Elderly of Twin Cities (Rawalpindi and Islamabad) of Pakistan. Curr Gerontol Geriatr Res [Internet]. Hindawi Publishing Corporation; 2014 [cited 2017 Jan 2];2014:230737. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25309589>
 24. Vafaei Z, Mokhtari H, Sadooghi Z, Meamar R, Chitsaz A, Moeini M. Malnutrition is associated with depression in rural elderly population. J Res Med Sci [Internet]. Medknow Publications; 2013 Mar [cited 2017 Jan 2];18(Suppl 1):S15-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23961277>
 25. Keshavarzi S, Ahmadi SM, Lankarani KB. The impact of depression and malnutrition on health-related quality of life among the elderly Iranians. Glob J Health Sci [Internet]. Canadian Center of Science and Education; 2014 Nov 26 [cited 2017 Jan 2];7(3):161–70. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25948441>
 26. Onder G, Penninx BWJH, Cesari M, Bandinelli S, Lauretani F, Bartali B, et al. Anemia is associated with depression in older adults: results from the InCHIANTI study. J Gerontol A Biol Sci Med Sci [Internet]. 2005 Sep [cited 2016 Sep 25];60(9):1168–72. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16183958>
 27. Corona LP, Duarte YA de O, Lebrão ML. Prevalence of anemia and associated factors in older adults: evidence from the SABE Study. Rev Saude Publica [Internet]. 2014 Oct [cited 2017 Mar 3];48(5):723–431. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25372162>

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Prevalence and determinants of Pre hypertension and Hypertension among urban high school adolescents of Hyderabad

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Abstract

Introduction: The Aetio-pathogenesis and risky behaviour determinants start early in adolescent period for the development of hypertension which poses a major public health problem with serious complications. These are amenable for prevention and therefore this study was taken up to determine prevalence and determinants of Pre hypertension and hypertension among high school adolescents.**Materials and methods:** A school based cross sectional study was carried out among adolescents studying in a schools attached to urban health training centre of Deccan college of Medical Sciences, Hyderabad. All the students from seventh class to tenth class consisting of 404 students were included. A semi structured questionnaire schedule was used based on Global school based student health survey questionnaire module; Anthropometry and blood pressure measurement was done by trained team using standardised procedures. Data was entered in Microsoft Excel 2007 and analysed. Frequency, mean, standard deviation and Chi square were done wherever required. Z scores were calculated using WHO Anthro-plus.**Results:** Out of total 404 students- boys accounted to 162(40.1%) and girls 242(59.9%). Prevalence of Pre Hypertension was 49(12%) and Hypertension was 52(13%) respectively. Mean age was 13.46±1.28 years; mean systolic blood pressure was 112.99±11.18 and mean diastolic blood pressure was 70.84±10.74 mm of Hg. Gender and junk food intake were the significant risk factors of Pre hypertension and Hypertension among adolescents. **Conclusion:** In this study behavioural determinants play a major role and these are amenable for prevention.

Key-words:Pre hypertension,Hypertension,Adolescents, Prevention, Hyderabad

Introduction

Adolescents account to nearly one-fifth of the world's population. They are 236.5 millions constituting 21% of total population in India.¹ The altered dietary practices and risky behavioural factors begins early during this adolescent stage in life and these have a strong impact on development of Hypertension.²

Hypertension is a “Silent Killer” and a complex public health problem as it constitutes an important risk factor for coronary heart disease, stroke, eye and renal complications. There is a wide variation in the prevalence of essential hypertension in India. South Indian prevalence varies from 7.2% to 21.4%.³⁻⁴ It is more prevalent in urban areas as compared to rural because of differing lifestyles in both populations.⁵ Tracking of blood pressure helps to identify pre hypertension and hypertension

thereby reduces the morbidity and mortality in adulthood. With globalisation and lifestyle changes in today's world, adolescents are exposed to various risk factors. These are mainly intake of junk food, processed food, reduced physical activity, alcohol and tobacco consumption. Most of these factors are amenable for prevention and this group is appropriate to intervene. India is experiencing epidemiological and nutritional transition and within this, Hyderabad is the most influenced by this change. As there is dearth of data about the magnitude and its determinants in this area an attempt has been made to study.

Aim and objectives:

To determine the prevalence and determinants of pre-hypertension and hypertension among high school adolescents.

Material and Methods

A school based cross sectional study was conducted in two schools which were attached to the urban health training centre attached to Deccan College of medical sciences located at old city of Hyderabad. High school students attending classes from seventh to tenth of the academic year 2016-17 were included in the study. Total four hundred and twenty four students were studying; out of which-chronic absentees' were 20 in number. The reasons for absenteeism were mainly- going to home town, engaged in other works and loss of interest in studies. Those who were absent on the day of study were interviewed the next days. So all together a total of 404 high school students who were pursuing education were included and assessed.

A pre- designed and pre tested semi structured questionnaire schedule was used by the trained team. Data was collected on identification details, anthropometry, blood pressure measurement and detailed questions on various determinants based on WHO designed Global School based student Health Survey (GSHS) questionnaire consisting of dietary habits, frequency of consumption of fruits and vegetables per week, frequency of intake of junk and fried food like chips, burgers, pizzas, bakery items, samosas etc.; extra salt consumption in the form of chutneys, pickles, papads and table salt addition; behavioural factors such as watching television/ mobile phone/ electronic gadgets for four hours or more per day; Regular physical activity in the form of cycling, outdoor games or running daily for half an hour, at least 5 times a week ; personal habits such as consumption of alcohol and tobacco in the last 30 days.⁶ A single Blood pressure measurement was done by using standardised procedures in sitting position on right arm using a digital sphygmomanometer(OMRON IAI) standardised everyday with diamond mercury sphygmomanometer. If found on higher side an average of three readings was taken with 10 minutes apart. This device has the advantage of ease of use and minimization of observer bias as it displays systolic, diastolic blood pressure and pulse rate using LCD digital monitor. Height was measured using stadiometer to the nearest 0.1cm and weight was measured with the student on bare foot and school uniform using electronic weighing machine to the nearest 0.1kg using standardised methods.

Normal blood pressure levels was defined as Systolic Blood Pressure (SBP) and Diastolic Blood Pressure(DBP) less than 90th percentile; Pre hypertension was defined as average SBP or DBP levels that are greater than or equal to 90th percentile but less than 95th percentile for gender age and height. Hypertension was defined as average SBP or DBP greater than or equal to 95th percentile for gender, age and height.⁷

Age adjusted Body Mass Index (BMI) was found out using WHO Anthro-plus software. Categorization of

nutritional status was based on Z score, the four categories were underweight (Z score < -2); normal (Z score from -2 to +2); over weight (Z score 2 to 3) and obese (Z score >3).⁸

Permission was obtained from the principals of concerned school and Institutional ethical committee. Informed and written consent was obtained from parents on a printed consent form distributed a day prior to the filling of the questionnaire. Subjects with high blood pressure were referred to the health centre along with their parents for further evaluation and were health educated about the importance of various determinants influencing higher blood pressure levels.

Data was entered in Microsoft excel 2010 and analysed using frequencies and mean \pm standard deviation wherever appropriate. Chi- square was calculated to depict the association between various determinants and prevalence of pre-hypertension and hypertension.

Results

Characteristics of the study subjects: A total of 404 subjects were analysed. Out of which boys accounted to 162(40.1%) and girls 242(59.9%). The age range was found between 12 years to 17 years. Mean age was found to be 13.46 \pm 1.28years .Distribution of subjects as per age and sex depicted in table 1

Table 1: Age and sex distribution of high school Adolescents

Age (years)	Gender		Total
	Male(%)	Female(%)	
12	32(20)	59(24)	91(22.5)
13	60(37)	64(26)	124(30.5)
14	36(22)	69(29)	105(26)
15	21(13)	41(17)	62(15)
16	10(6)	6(2.5)	16(4)
17	3(2)	3(1.5)	6(2)
Total	162(100)	242(100)	404(100)

Table 2: Age wise distribution of systolic and diastolic blood pressure

Age	Mean systolic blood pressure	Mean diastolic blood pressure
12	110.19 \pm 10.85	72.52 \pm 10.01
13	111.38 \pm 10.83	71.19 \pm 11.73
14	115.38 \pm 10.83	71.19 \pm 11.73
15	114.61 \pm 11.98	68.86 \pm 9.39
16	117.86 \pm 8.32	72.57 \pm 8.65
17	119.80 \pm 14.09	67.60 \pm 11.88
Total	112.99 \pm 11.18	70.84 \pm 10.74

Table 3: Prevalence of Pre hypertension and Hypertension among High school adolescents

Classification	Male (%)	Female (%)	Total (%)
Normal	132 (81.4)	171(70.6)	303 (75)
Pre hypertension	12(7.4)	37 (15.2)	49 (12)
Hypertension	18(11.2)	34 (14.2)	52 (13)
Total	162 (100)	242 (100)	404 (100)

Table 4:Association between various determinants and Pre hypertension and Hypertension

Determinants	Normal N=303	Pre -HT N=49	HT N=52	Chi-square, P-value df
Gender				
Males	132(43.5)	12(24.5)	18(34.6)	7.136, 0.028*, df=1
Females	171(56.5)	37(75.5)	34(65.4)	
Extra salt Intake				
Yes	286(94)	44(90)	50(96)	2.061, 0.357, df=1
No	17(6)	5(10)	2(4)	
Junk food Intake				
Not at all	112(40)	11(22)	7(13)	10.337, 0.035*, df=4
<4days/week	89(29)	18(37)	19(36)	
>4days/week	102(31)	20(41)	26(51)	
Soft drink intake				
Not at all	78(26)	13(27)	15(29)	3.289, 0.511, df=4
<4days/week	112(37)	16(32)	15(29)	
>4days/week	113(37)	20(41)	22(42)	
Watching TV				
>=4hrs/day	180(59)	27(55)	40(77)	6.859, 0.14,df=1
< 4hrs/day	123(41)	22(45)	12(23)	
Physical activity				
Not at all	48(16)	25(51)	20(38)	6.328, 0.176, df=4
Occasional	125(41)	15(31)	18(35)	
Regular	130(43)	9(28)	14(27)	

HT-Hypertension, *-Significant

Mean height was 150.35±7.70cms;Mean weight was 39.77±9.65kgs; Mean systolic blood pressure was 112.99±11.18mm of hg and Mean diastolic blood pressure was 70.84±10.74mm of hg. Table 2 depicts the age wise distribution of mean systolic and diastolic blood pressure .

Prevalence of prehypertension among adolescents was found to be 49(12%) and hypertension was 52(13%). Gender wise distribution of prevalence illustrated in table 3

To determine the association between various determinants and prevalence of Pre- Hypertension and

Hypertension Chi-Square was calculated. Among these gender and junk food intake were found statistically significant. Other variables such as extra salt intake, frequent junk food intake, frequent soft drink intake, watching TV/any electronic gadgets and no physical activity were associated with increased blood pressure but were not statistically significant. Regular fruit and vegetable intake, alcohol & tobacco consumption and high body mass index were not associated with increased blood pressure levels in our study. Tobacco usage was found among 13(3.2%) and alcohol consumption among 11(2.7%). Based on Z score undernourished were 13(3%), normal 369(91.5%), overweight 10(2.5) and obese 12(3%).

Discussion

Our study found the prevalence of Pre-Hypertension and Hypertension to be 12% and 13% respectively. In contrast to our study high prevalence of Pre-Hypertension 12.3% and Hypertension 21.2% was found among the high school students of Mthatha (South Africa) conducted by Benedicta et al.⁹ A study conducted by Bertrand Fikahemet al among Brazzaville, Congo students also reported high prevalence of Pre-Hypertension 20.7% and 10 % hypertension.¹⁰ Similar to our study Satyanarayana et al of Hyderabad found 11.5% Pre-Hypertension and 9.7% hypertension respectively among the same age group.¹¹ School students of Shimla were found to have 14.3% Pre-hypertension and 4.3% hypertension respectively by Avinashsharma et al.¹² These variations in prevalence rates may be due to different methodology , criteria for diagnosis and regional variations.

In our study gender was found to be statistically significant determinant of Pre hypertension and hypertension. Similarly Tanuanand et al who has conducted study among Delhi school adolescents also found more among females and was statistically significant.¹³ In contrast to this Eltagi A M Abdal et al found 14% hypertension among Sudanese boys and 8.4% among girls;¹⁴ Jasmine S Sundare et al found the higher prevalence(31.7%) among high school males of Chennai which was statistically significant.¹⁵ This gender difference may be attributed to hormonal changes that occur during puberty which had been noted to occur more rapidly in females than in males and also the stress associated with menarche could be one of the reason.¹⁶

Significant association was found with the intake of junk food for the frequency of >=4 times a week in our study. Similarly Satyanarayana et al found significant association with junk food intake among Hyderabad adolescents.¹¹ Anuradha et al found no such significant association with the frequency of junk food intake among Erode adolescents.¹⁷ The intake of junk food which is rich

in saturated fat and high carbohydrates may be the precipitating factor for the vascular damage

However our study found higher prevalence of pre-hypertension and hypertension among those who take extra salt intake, frequent soft drink intake, watching TV/electronic gadgets for more than 4 hours per day and no physical activity but was not statistically significant.

Our study depicted no association with body mass index, alcohol and tobacco intake but Fortune A Ujunwaetal found significant association with BMI, alcohol and tobacco consumption among Nigerian adolescents.¹⁸ Jamal Qaddumietal conducted study among Palestinian adolescents where they found the prevalence to be higher among obese and those who smoke regularly.¹⁹ A study conducted by Pragyakumaretal among adolescents of Patna found significant association between prevalence of pre hypertension/hypertension and BMI.²⁰ This may be due to the significant ill effect be noticed only after longer duration of intake of alcohol and tobacco (dose and duration related).

Conclusions: Our study depicted the prevalence of Pre hypertension and Hypertension to be 12% and 13% respectively. Various determinants were gender, dietary habits and physical activity associated with Pre hypertension and Hypertension. Among these the gender and regular intake of junk food were statistically significant. This study helps us to know about the associated determinants of Pre Hypertension and Hypertension during adolescence period which are amenable for prevention of complications in adulthood

Recommendations : Regular screening of blood pressure at schools, school health education about the complications associated with hypertension, encouraging healthy diet by avoiding junk food/extra salt intake and regular physical activity at school are the primordial and primary preventive strategies which are at utmost importance to be adopted.

Limitations: The main limitation of this study is that - these results cannot be generalized as the sample size is less and have not included the family history, mode of transport and stress determinants..

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References

1. Strategy handbook. Rashtriyakishorwasthyakaryakram. Adolescent health division ministry of health and family welfare. Government of India January 2014 [internet]. [cited 2017 January 18]. Available from: <https://www.dropbox.com/s/0oj4p422y7st4ku/RKSK%20Strategy%20Handbook.pdf>
2. WHO. Health needs of adolescents. Report of a WHO expert committee. Geneva, World health organization, 1977 (WHO Technical report series, No. 609). Available at: [whqlibdoc.who.int/trs/WHO TRS 609 pdf](http://whqlibdoc.who.int/trs/WHO_TRS_609.pdf).
3. Vedavathy S, Sangamesh. Prevalence of hypertension in urban school going adolescents of Bangalore, India. International journal of contemporary paediatrics. 2016;3(2):416-423
4. Lawrence tony, Binu Areekal, Anish Thekkumkara Surendran Nair, Reshmi Ramachandran, Rekha Rachel Philip, R. S. Rajasi, Vijayakumar K. Prevalence of hypertension and pre-hypertension among adolescent school children in Thiruvananthapuram, Kerala, India. Int J Community Med Public Health 2016;3: 3556-63
5. WHO. Non-communicable disease in South East Asia region. Situation and response. New Delhi: South East Asia regional office, WHO; 2011. Available- www.searo.who.int/.../2011_non_communicable_diseases_in_the_south_east_asia_re
6. Global school-based student health survey (GSHS) 2013 core questionnaire modules. Updated: 01 January 2013. Cited on [10-12-2016]; Available at www.who.int/chp/gshs/india/en
7. National High Blood Pressure Education Programme Working Group on High Blood Pressure in Children and Adolescents. The fourth report on the diagnosis, evaluation and treatment of high blood pressure in children and adolescents. Paediatrics. 2004;114:555-76.
8. WHO AnthroPlus for personal computers Manual: Software for assessing growth of the world's children and adolescents. Geneva: WHO, 2009. (<http://www.who.int/growthref/tools/en/>)
9. Benedicta N. Nkeh-Chungag, Anna M. Sekokotla, Constance Sewani-Rusike, Ambrose Namugowa, Jehu E. Iputo. Prevalence of hypertension and pre-hypertension in 13-17 year old adolescents living in Mthatha - South Africa: a cross-sectional study. Cent Eur J Public Health 2015; 23 (1): 59-64
10. Bertrand Fikahem Ellenga Mbolla, Annie Rachel Okoko, Jean Robert Mabila Babela, Gaston Ekouya Bowassa, Thierry Raoul Gombet, Suzy-Gisèle Kimbally-Kakyand Benjamin Longo-Mbenza. Prehypertension and Hypertension among Schoolchildren in Brazzaville, Congo. International journal of hypertension. 2014;

11. Satyanarayana K, Kandhi P, Pereira KR. Study of prevalence and determinants of hypertension among the urban school going children aged 10–15 years. *Ann Trop Med Public Health* 2016; 9:421-4
12. Avinashsharma, neelamgrover, shayamkaushik, rajivbhardwaj and naveensankhyan. Prevalence of Hypertension Among Schoolchildren in Shimla. *Indian Pediatrics*.2010;47(17):873-76
13. TanuAnand, G. K. Ingle, G. S. Meena, Jugal Kishore and Rajesh Kumar. Hypertension and Its Correlates Among School Adolescents in Delhi. *Int J Prev Med*. 2014; 5: S65–S70.
14. Eltagi A M Abdalla, AfraaEdrees, Abdelbasit A Mohammed ahmed. Prevalence of Hypertension among Secondary School Students in Umbada Area “Block 14” in Khartoum State-Sudan. *IOSR Journal of Dental and Medical Sciences*2016;15(12):74-78
15. Sundar JS, Adaikalam JMS, Parameswari S, Valarmarathi S, Kalpana S. Prevalence and Determinants of Hypertension among Urban School Children in the Age Group of 13- 17 Years in, Chennai, Tamilnadu.2013. *Epidemiol*; 3: 130. doi:10.4172/2161-1165.1000130
16. MonyekiKD, KemperHCG: Risk factors for elevated blood pressure and how to address cardiovascular risk factors. A review in paediatrics population. *Hum Hypertens* 2008;22:450-459
17. G Anuradha, G Muraleetharan, R Abinaya, M Tamilkodi, S Sachithanatham. Prevalence of Prehypertension and Hypertension and its Determinants among Adolescent School Children of a Semi-urban Area in Erode District, Tamil Nadu. *International Journal of Scientific Study*.2017; 4:55-60
18. Fortune A Ujunwa, Anthony N Ikefuna, Ada RC Nwokocha and Josephat M Chinawa. Hypertension and prehypertension among adolescents in secondary schools in Enugu, South East Nigeria. *Italian Journal of Pediatrics* 2013 39:70.
19. Jamal Qaddumi , Margo Holm , Abdullah Alkhalwaldeh, Mohammed Albashtawy, Omar AL Omari , Abdul-MonimBatiha , FadwaAlhalaiqa , Mohammad Suliman. Prevalence of pre- hypertension and Hypertension among secondary school students. *International journal of advanced nursing studies*.2016;5(2):240-45
20. Pragya Kumar, Dhananjay Kumar, AlokRanjan, Chandra Mani Singh, Sanjay Pandey, Neeraj Agarwal. Prevalence of Hypertension and its Risk Factors Among School Going Adolescents of Patna, India. *Journal of Clinical and Diagnostic Research*.2017;11(1): SC01-SC04

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Factors amounting to the delay in diagnosis and treatment of pulmonary Tuberculosis: A cross sectional study in a tertiary care hospital of South India

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Abstract

Introduction: The most essential components of TB control are early diagnosis and adequate treatment. Delay in the diagnosis and treatment of tuberculosis may result in more extensive disease, more complications, increase severity of the disease and is associated with higher risk of mortality. It has been seen that patients move from one health care provider to other resulting in delay in diagnosis and start of treatment for tuberculosis. The purpose of this study was to identify factors associated with delayed diagnosis of TB. **Material and methods:** A cross sectional study was conducted between 1st November to 31st December 2016 among 53 new sputum positive (NSP) TB patients registered under the DOTS centre in a tertiary care teaching hospital. We used the questionnaire of WHO multi-country study to estimate the diagnostic and treatment delay in TB. Data was collected and entered in Microsoft Excel sheet and was analysed using Epi-Info (version,3.5.1) and open Epi software. **Results:** The median patient delay, health system delay, and total delay were 22 days, 3 days and 29.5 days respectively. The unacceptable patients delay was 51.21% (95% CI: 45.12-53.29) of all new patients, whereas it was 21.87% (95% CI: 17.23-26.24) for the unacceptable health system delay and the unacceptable total delay was 54.21% (95% CI: 47.91-57.75). **Conclusion:** TB diagnosis and treatment is still a significant problem. Majority of unacceptable delays were from patient's side. Identifying factors influencing delays and developing evidence-based approaches to address those delays will help in advancing tuberculosis prevention and management.

Keywords: Cross-sectional study, DOTS, Health system delay, Patient delay

INTRODUCTION

One-third of the world's population is thought to be infected with TB. More than 5.7 million new cases of TB (all forms, both pulmonary and extra-pulmonary) were reported to WHO in 2013; 95% of these cases are reported from developing countries. However, because of insufficient case detection and incomplete notification, reported cases may represent only about two-thirds of the total estimated cases. The WHO estimated that 9 million new cases of TB occurred worldwide in 2013. The South-East Asia Region accounts for 39% of the global burden of TB in terms of incidence and India alone accounts for 24% of the world's TB cases. India is the highest TB burden country in the world in terms of absolute number of incident cases that occur each year¹.

The risk of acquiring M. Tuberculosis infection is determined mainly by exogenous factors. The probability

of contact with a person who has an infectious form of TB, the intimacy and duration of that contact, the degree of infectiousness of the case, and the shared environment in which the contact takes place are all important determinants of the likelihood of transmission. Because of delays in seeking care and in making a diagnosis, it is generally estimated that, in high-prevalence settings, up to 20 contacts maybe infected by each AFB-positive case before the index case is diagnosed².

Unlike the risk of acquiring infection with M. Tuberculosis, the risk of developing disease after being infected depends largely on endogenous factors, such as the individual's innate immunologic and non-immunologic defences and the level at which the individual's cell mediated immunity (CMI) is functioning³.

Limited knowledge about signs and symptoms of TB, poor health seeking behaviour, and poor diagnosis and disease management in health facilities result in delays in TB diagnosis and treatment, which in turn, increase the risk of TB transmission and the development of MDR-TB⁴. Available evidence shows that only 47% of Chinese patients with TB symptoms seek healthcare in a timely fashion and only 59% comply with prescribed treatment⁵.

Delay in diagnosis of TB and initiation of anti-tubercular treatment (ATT) contributes to more severe disease manifestations in the individual and higher disease transmission in the community. This delay occurs at three levels:

1. Firstly the patients may ignore their symptoms and take longer to approach a health care provider (**pre-provider delay**).
2. Second, health care providers may fail to diagnose TB, and unsuccessfully treat patients for other competing conditions (**provider delay**).
3. Lastly, a delay may occur while diagnosis is being established during hospitalization (**in hospital delay**).

To assess the above factors a cross-sectional study was performed amongst patients with tuberculosis attending the district DOTS centre. A pilot tested questionnaire was administered to these patients to determine time periods each of them have spent before seeking healthcare, time spent in the referral chain with various health care providers and during hospital till the time a definite diagnosis was made and anti-tubercular therapy was initiated.

Biostatistics shows huge gap between the number of cases registered in the tuberculosis centres and the actual estimated disease burden. This study is an attempt to invert the ice-berg of tuberculosis prevalence in the society by identifying factors associated with the delay in healthcare seeking behaviour. Application of the collected and analysed data for decreasing the number of undiagnosed cases is an avenue for further evaluation and appropriate actions towards prevention.

MATERIALS AND METHODS

Study area and population: A cross sectional study was conducted among the new sputum positive (NSP) TB patients registered under the DOTS centre in a tertiary care teaching hospital of Mandya district.

Operational definitions:

We have defined the 'total delay' as the time interval from the onset of symptoms of TB until the initiation of anti-tuberculosis drugs, arbitrarily we have taken delay of > 28 days as total delay. It is the sum of two time intervals: 'patient delay' is defined as time interval between onset of symptoms and presentation to a health care provider, arbitrarily we have taken it as > 30 days and 'health system delay' is defined as time interval between the consultation at a health facility and the

initiation of anti-tuberculosis treatment, arbitrarily we have taken it as > 7 days. The total delay will also be considered as the sum of diagnostic delay and treatment delay. Diagnostic delay is defined as the time interval between the onset of symptoms and labeling of the patient as a tuberculosis patient (tuberculosis diagnosis) while treatment delay is defined as the time interval between tuberculosis diagnosis and initiation of anti-tuberculosis drugs. Health facility is defined as all government and private health facilities manned by qualified health care providers⁶.

Sample size and Sampling procedure:

In DOTS centre of our tertiary teaching hospital, Mandya district, during November and December 2015, about 51 NSP cases were registered. With this it is expected that during two months of data collection approximately 50 patients can be recruited for the study. The sampling method was purposive sampling method.

Inclusion criteria: All new sputum positive patients who gave consent and reported DOTS centre during study period.

Exclusion criteria: Those patients who were seriously ill or debilitated at the time of interview.

Data collection:

We used the questionnaire of WHO multi-country study to estimate the diagnostic and treatment delay in TB. The questionnaire was pilot-tested on 10 TB patients and then based on results of pilot testing it was suitably modified for local use. Using this questionnaire, the TB patients were interviewed and data was collected about socio-demographic characteristics and factors determining the delay in diagnosis and treatment of TB.

Period of data collection: Data was collected for a period of two months from 1st November to 31st December 2016

Data analysis:

Data was collected and entered in Microsoft Excel sheet and was analyzed using Epi-Info (version, 3.5.1) and open Epi software. We calculate the mean and median delays along with their ranges. We calculated the proportion delay with its confidence interval for the risk factors associated with patient, health system and total delays.

Ethical consideration: Informed consent was taken from the persons before collecting information and an Ethical committee approval was obtained from Institutional ethical committee.

RESULTS

All the 53 new smear positive pulmonary TB patients who got registered in the DOTS centre of a tertiary care teaching hospital during the study period were enrolled. The median patient, health system and total delay were 22 (IQR 9-49), 3 (IQR 0-5) and 29.5 (IQR 10-51) days respectively [Table 1].

Majority of study subjects were male and most of study participants were from rural area. Most of them had schooling up to primary standard. Majority of them were smoking or used to smoke. When we compare the

knowledge and symptoms of the study participants it was seen that majority of them had the knowledge about tuberculosis and most of them presented with fever and cough at the time of diagnosis. Majority of the study participants first contact with the health was with the Government health facility [Table2].

Table-1 Magnitude of delay at various levels

Characteristics	Number of days	Delay (%)	95% CI
Patient delay	148	51.21	45.12-53.29
Mean(SD)	38.51(56.33)		
Median(IQR)	22(9-49)		
Health system delay	65	21.87	17.23-26.24
Mean(SD)	11.36(41.26)		
Median(IQR)	3(0-5)		
Total delay	188	54.51	47.91-57.75
Mean(SD)	55.48(72.67)		
Median(IQR)	29.5(10-51)		

The prevalence of patient delay was 51.21% (95% CI: 45.12-53.29) [Table 1]. The given [Table 2] illustrated that there was high prevalence of patient delay observed among those who lived in rural areas (67.19%, 95% CI: 59.36-76.24). The patients who were unable to achieve the primary education have 59.67 % (95% CI: 48.22-71.91) of patient delay. In addition, 68.21% (95% CI: 52.62-83.65) of the patient delay has been observed among the respondents, who smoked < 11 cigarettes per day. The patients, who lived more than 2 km far from the DOTS centers had the high prevalence of patient delay (69.13%, 95% CI: 59.12-79.39).

However, the patient who had completed their secondary education were found to have less patient delay (42.26%, 95% CI: 34.36-53.35) in comparison with those who were less educated. Similarly, those who have an access of DOTS center within walking distance were observed to have less prevalence of patient delay (46.65%, 95% CI: 43.28-54.22).

This study revealed that the proportion of health system delay was 21.87% (95% CI: 17.23-26.24) [Table 1]. The increased prevalence was observed among those who don't have basic knowledge on tuberculosis (35.38%, 95% CI: 27.21-45.39). However, daily wage workers (10.71%, 95% CI: 1.02-45.39) had less prevalence of health system delay [Table 2].

DISCUSSION

The present study is undertaken at a DOTS centre in South India to know the, magnitude and reasons for various types of delay in seeking treatment for TB.

Majority of those who attended the centre were males and were below 45 years of age. These findings are similar to other Indian studies. This could be explained by the fact that males in India are generally more literate, financially

independent and are not culturally inhibited to go to a health care facility⁷.

Most of the study subjects had only primary schooling. It is a well-established fact that incidence of TB correlates inversely with educational status persons with less education are also likely to delay seeking medical help, compared to those with higher education. These findings are similar to those of other Indian and south Asian studies⁸.

Majority of the subjects are from rural areas, but a positive association cannot be inferred because this centre caters mostly to rural population. Most of the studies also report a higher incidence of cases from rural areas⁹. There is a need for TB awareness programmes in rural areas and also establishment of more primary healthcare facilities to diagnose TB in remote regions.

In the present study 81% of the subjects were smokers. There is significantly more delay among smokers in seeking treatment than non-smokers. This is a consequence of the misconception amongst the smokers that cough, the most predominant symptom of TB is smoker's cough. Most of the smokers in the present study also had chronic bronchitis, with similar symptoms as those of pulmonary TB. This is a major factor in misdiagnosis and delay in treatment. Another study from rural central India reported that being a smoker is a significant factor in pre provider delay and concurs with the present study¹⁰.

The main symptoms for which the subjects sought treatment were fever with cough, cough, weight loss and chest pain. There is a need to educate rural people about these symptoms through mass media campaigns. Most of the patients first went to a traditional healer for treatment. This is true not only in India but also in China where the belief in traditional medicine is very strong¹¹. Hence there is a need to train the traditional healers to identify the symptoms of TB and motivate them to refer suspected cases to TB diagnostic centers.

In the present study, the first contact of the subjects with a qualified person were either a PHC medical officer or a general physician. To avoid delay at the point of first contact, regular training and continuing medical education must be provided to PHC faculty and private practitioners from rural areas. Most of the subjects delayed seeking treatment in the hope of spontaneous resolution of symptoms, others were in fear of a diagnosis and some had economic constraints. Some patients had to travel >2 km to a healthcare facility. Whereas other Indian studies reported a distance of 50 km to a healthcare facility which is far worse than the present study. Other factors that constrain the patients are the cost of going to a private practitioner and hidden costs like travel expenses and loss of wages. These have to be overcome by improving the infrastructure in government run Primary health centres, making doctors available round the clock and training of paramedical staff in detecting TB. All the other Indian studies concur with these findings¹².

Surprisingly, knowledge about TB is good (75%) in the subjects. They knew the mode of spread, the curability of the disease and that treatment is for a long period. The

role played by mass media in spreading this knowledge is laudable and there is a need for sustained campaign utilizing these media.

Table 2: Prevalence of patient delay and health system delay by different independent variables and their 95% CI

Characteristics	Patient Delay			Health system delay		
	n	(%)	95% CI	n	(%)	95% CI
Gender						
Male	26	55.85	49.41-62.28	12	28.07	22.40-33.73
Female	10	54.14	45.76-62.52	5	29.85	22.34-37.38
Age(years)						
<45	19	53.01	44.89-61.13	11	35.56	27.89-43.22
≥45	17	58.43	50.12-66.54	6	22.51	15.72-29.31
Residence						
Urban	14	48.79	43.39-55.13	9	30.72	25.54-36.79
Rural	22	67.19	59.36-76.24	8	24.44	16.79-31.71
Educational Status						
Upto Primary	20	59.67	48.22-71.91	7	20.64	11.58-30.28
Secondary and above	15	42.26	34.36-53.35	11	34.51	25.76-43.51
Employment status						
Daily wagers	20	49.41	30.78-68.05	5	10.71	1.02-23.21
Others	22	63.39	53.55-73.23	8	20.21	12.21-28.22
Smoking						
Never	6	52.13	45.17-58.43	4	29.52	23.78-35.68
Currently /used to smoke but stop currently	30	59.67	51.76-67.63	13	27.33	20.14-33.76
No. of beedies/cigarette smoked per day(n=41)						
<11	15	68.21	52.62-83.65	5	19.13	6.61-33.52
≥11	14	51.71	42.46-61.16	6	24.19	15.71-32.03
Symptoms present before diagnosis (n=50)						
Cough	10	56.14	42.77-68.32	5	26.61	21.31-34.17
Fever and cough	23	51.62	46.61-57.92	12	22.44	11.32-33.12
Basic knowledge on TB						
Yes	23	53.31	47.33-58.13	17	22.17	17.22-27.43
No	8	54.12	44.75-61.22	5	35.38	27.21-45.39
Distance to reach the TB center						
≤2K.M	13	46.65	43.28-54.22	7	26.23	21.32-33.52
>2K.M	25	69.13	59.12-79.39	8	23.42	14.39-33.72
Centre of first contact						
Government health facility	27	53.42	46.71-60.42	14	25.91	21.36-34.21
Private health facility	8	50.71	42.68-58.44	5	22.91	18.87-31.63

Delay in seeking treatment is more on part of the patient rather than the health care providers. This is a consistent finding of all studies whether they are from China, South-east Asia or Latin America. Hence there is a urgent need to step up TB awareness campaigns on the lines of HIV. There is a gender angle to the treatment seeking behavior with more delay on the part of women. This is due to

socio cultural factors. Smoking is a serious factor which masks the diagnosis.

There is also a need to address delay at a health care facility with a similar delay was found in other studies. As most of the cases were diagnosed by an internist or a general physician there is a need to conduct regular CME programmes on TB for doctors from other specialties. As most of the patients preferred to visit private doctors

rather than government facilities, there is a need to develop public private partnership so that even privately treated patients have access to free medicines. As TB is a disease with a long course of treatment purchasing the drugs can be a drain on the patients' finances and may lead to default of treatment.

Conclusion:

Throughout the study, there were significant differences in socioeconomic status, feeling of stigma, knowledge and satisfaction with care. Most patients acknowledged accessibility of private practitioners and greater confidence in being cured as the main reasons for seeking initial care from the private sector compared to their lack of confidence in the quality of services in the public sector. Stigma proved to be a major determinant of health-seeking behaviour, where fear of being diagnosed with tuberculosis and fear of social isolation, were the main obstacles to timely health-seeking behaviour. A strong emphasis on health education is therefore recommended. The significant risk factors for health care system delay that were frequently reported from the studied countries were: time to reach health facility of more than half an hour, economic burden of the disease and high cost of medical services, seeking care at a non-specialized health facility including the private sector, and more than one health care encounter before diagnosis.

Recommendations :

Efforts should be made to increase public awareness about the symptoms of tuberculosis and to educate them about the importance of seeking early care and the availability and location of free diagnostic services.

Efforts should be made to educate both public and private physicians about the need to maintain a high index of suspicion of tuberculosis and rapidly performing appropriate tests.

Effective collaboration should be developed between private and public providers to ensure an effective public-private mix of services.

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REFERENCES

1. Dhanvij P, Joshi R, Kalantri S. Delay in diagnosis of tuberculosis in patients presenting to a tertiary care hospital in rural central India. *J MGIMS*, September 2009, Vol 14, No (ii), 56-63.
2. Ashutosh Tamhane, Girish Ambe, Sten H Vermund, Connie L Kohler, Alka Karande and Nalini Sathiakumar. Pulmonary Tuberculosis in Mumbai, India: Factors Responsible for Patient and Treatment Delays. *J Prev Med*. 2012 Aug;3(8): 569 – 580.
3. Rajesh Thakur and Manoj Murhekar, Delay in Diagnosis and treatment among TB patients registered

under RNTCP Mandi, Himachal Pradesh, India 2010 *Indian J Tuberc*. 2013 Jan;60(1):37-45

4. Donald PR, van Helden PD: The global burden of tuberculosis—combating drug resistance in difficult times. *N Engl J Med* 2009, 360:2393–2395.

5. Wang Y: [Report of the Fifth National Sampling Survey of TB Epidemiology]. Beijing: Military Medical Science Press; 2011:1–7.

6. Chandrashekar T Sreeramareddy, Zhi Zhen Qin, Srinath Satyanarayana, Ramnath Subbaraman and Madhukar Pai. Delays in diagnosis and treatment of pulmonary tuberculosis in India: a systematic review. *Int J Tuberc Lung Dis*. 2014 March; 18(3):255 – 266.

7. Roshan Kumar Mahato, Wongsu Laohasiriwong, Kriangsak Vaeteewootacharn, Rajendra Koju, Ratna Bhattarai. Major delays in the diagnosis and Management of Tuberculosis Patients in Nepal, *Journal of Clinical and Diagnostic Research*, 2015 Oct, Vol-9(10): LC05-LC09.

8. Seyed Mohammed Alavi, Pejman Bakhtiyariniya, Ali Albagi, Factors Associated with Delay in Diagnosis and Treatment of Pulmonary Tuberculosis; *Jundishapur J Microbiol*. 2015 March; 8(3).

9. Jing Cai, Xianhua Wang, Aiguo Ma, Qiuzhen wang, Xiuxia Han, Yong Li Factors Associated with patient and Provider Delays for Tuberculosis Diagnosis and Treatment in Asia: A systematic Review and Meta-Analysis *PLoS ONE* 10(3).

10. Ying Li, John Ehiri, Shenglan Tang, Daikun Li, Yongqiao Bian, Hui Lin, Caitlin Marshall and Jia cao, Factors associated with patient, and diagnostic delays in Chinese TB patients: a systematic review and meta-analysis *BMC Medicine* 2013, 11:156.

11. Carolyn M Ford, Angela M Bayer, Robert H Gilman, Dami Onifade, Colleen Acosta, Lilia Cabrera, Carillos Vidal and Carlton A Evans, Factors Associated with Delayed Tuberculosis Test-seeking Behaviour in the Peruvian Amazon, *Am.J.Trop.Med.Hyg*, 81(6),2009,pp.1097-1102.

12. Eric Osei, Patricia Akweongo and Fred Binka., Factors associated with delay in diagnosis among tuberculosis patients in Hohoe Municipality, Ghana., *BMC Public Health* (2015) 15:721 doi 10.1186/s12889-015-1922-z

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Comparison of Drug Resistance pattern under supervised Vs unsupervised treatment of Tuberculosis**Ashish Kumar Gupta¹, Tariq Mahmood², Mohd Haroon Khan³**¹Department of Respiratory Medicine UP Rural Institute of Medical Science & Research Saifai Etawah(U.P.)²Department of Respiratory Medicine MLN Medical College Allahabad (U.P.) ³Department Of Community Medicine, SHKM Govt Medical College, Nalhar (Nuh), Haryana**Date of Submission** : 25-09-2017**Date of online Publication** : 10-10-2017**Date of Acceptance** : 03-10-2017**Date of Print Publication** : 31-12-2017**Address for correspondence:** Dr. Mohd Haroon Khan, Assistant Professor , Department Of Community Medicine, SHKM Govt Medical College, Nalhar (Nuh) , Haryana. Pin.122107. E-mail: drharoonkhan99@yahoo.com, drharoonkhan99@gmail.com**Abstract**

Background: The prevalence of drug resistance was higher in areas with poor tuberculosis control. Resistance to Anti tuberculosis treatment was found in all 35 countries and regions surveyed. **Objective:** To Compare of Drug Resistance pattern in cases under supervised vs unsupervised treatment. **Study design:** Hospital based study. **Setting:** Department of Pulmonary Medicine, Motilal Nehru Medical College (MLNMC), Allahabad, (U.P) India. **Participants:** 52 patients. **Sampling:** Purposive sampling method. **Results:** Out of 52 patients 23(44.23 %) were relapse, 22(42.30 %) were treatment failure and 7(13.46) were defaulter. Treatment failure cases were more in unsupervised group 28.84% compare with supervised group 13.46%, relapse were more in supervised group 26.9%, as compared to unsupervised group 17.3% and defaulter were more in unsupervised group 11.5%, as compare to supervised group 1.96%. nine patients (17.6%) who took supervised treatment previously were susceptible to all tested drug as compare to unsupervised group in which 3(5.9%) cases were susceptible to all tested drug. 6(11.76%) cases were single drug resistance in supervised group as compared to unsupervised in which 7(13.72%) cases were single drug resistance. Poly resistance were more 12 (23.53%) in unsupervised group as compare to supervised group in which 4(7.84%) cases were poly resistance. Multi drug resistance cases were more 7(7.84%) cases in unsupervised group as compare to supervised group in which 3(5.90%) cases were multi drug resistance. **Conclusion:** It was concluded that supervised strategy was superior to unsupervised treatment in controlling the tuberculosis infection and in preventing the emergence of drug resistance tuberculosis

Key-words: Multi drug resistance, Defaulter, Treatment failure, Relapse, supervised, unsupervised**Introduction:**

Resistance to anti tuberculosis treatment was threat to Global Tuberculosis control programme and call for an urgent action to reduce this threat. Increase in migration between countries, international travel and trade and the global HIV Pandemic, all the likely to increase the global burden of drug resistant tuberculosis. ^[1]

Directly observed treatment strategy alone is clearly insufficient for Multi drug resistance Tuberculosis and the outcome of standard short course chemotherapy in this setting remains uncertain. Furthermore, unacceptable

failure rates have been reported and resistance to additional agent may be induced. As a result of this there have been calls for well functioning. Directly observed treatment strategy program is engaged to provide additional services in areas with high rates of Multi drug resistance Tuberculosis. World Health Organization in collaboration with other agencies and institution therefore established the working group on directly observed treatment strategy plus for Multi drug resistance Tuberculosis ^[2, 3]. The present study was carried out to Compare of Drug Resistance pattern in cases under supervised vs unsupervised TB treatment.

Material & Methods:

The present hospital based study entitled “Comparison of Drug Resistance Pattern under supervised vs unsupervised treatment for tuberculosis” was conducted in the Department of Pulmonary Medicine, Motilal Nehru Medical College, Allahabad, (U.P) India. Patient above 15yr of age attending the OPD of TB and chest disease and other departments of Swroop Rani Nehru hospital and those admitted in TB and chest word of Swroop Rani Nehru hospital, a tertiary health care center were studied. A total of 52 patients, suspect of drug resistant pulmonary tuberculosis i.e who were defaulter, relapse, treatment failure and sputum positive at microscopy centre under RNTCP at SRN hospital Allahabad were studied. Sputum sample of these patients were subjected for culture and sensitivity by radiometric method. Approval for study was passed from the institutional board of study meeting. Purposive sampling i.e. non-random sampling to include subjects that serve the specific purpose was used.

Inclusion criteria:

A TB patient who fail on RNTCP cat I (sputum positive after 5th month or more).

A TB patient who fail on Cat II DOTS (sputum positive after 4th month).

Failure of Anti tuberculosis treatment in non government organization.

Patient who interrupt their treatment for more than 2 month after having received a total of at least 1mt of anti TB treatment and who then return with bacteriologically confirmed TB (Return after default).

Patients who continue to be smear positive after the completion of a retreatment regime Patients who have failed a cat IV regime or regime containing second line drugs.

Ethical considerations are local cultural values and ideas were respected. Confidentiality was assured. An informed consent was taken before collecting data. The data were collected by using pre-designed and pre-tested semi structured questionnaire. It included information regarding Identification of Patient, HIV Status, Previously treated for TB, Information about previous treatment and outcome of previous treatment.

The enrolled patients were made to under go following investigation: Ziehl Neelsen staining, Culture and sensitivity was done by using radiometric method BACTEC 460. Identification of the Mycobacterium tuberculosis complex is based on the observation that P-nitro alpha acetyl amino-hydroxy beta propiophenone (NAP) will inhibit organisms belonging to the Mycobacterium tuberculosis complex while having little or no effect on other mycobacteria. Test organism inoculated to a BACTEC NAP vial containing 5µg NAP disk displaying a significant increase in the growth index over 5 day incubation period would tend to rule out Mycobacterium tuberculosis complex organism.

Susceptibility was done by using BACTEC 12B vial containing middlebrook 7H₁₂ broth at the drug test concentration as listed below.

Concentration (µGML) of drugs tested by the BACTEC 460 method -

Isoniazid	-	0.4
Streptomycin	-	6
Pyrazinamide	-	100
Ethambutol	-	7.5
Rifampicin	-	2

All the culture and sensitivity is done at VIMTA tabs, Hyderabad.

Data entry and statistical analysis was carried out using SPSS 11. Numbers and percentages were used. Significant difference was determined using Chi- square test. P-value was calculated using chi-square test and difference was accepted significant at more than 95% (p-value <0.05).

Results:

Out of total 52 patients, 37 (71.15%) patients belongs to the age of 15 to 45 years and 15(28.84%) were above the age of 45 years. The youngest patient was 18 years of age and the oldest was 75 years of age. (Table1) Among study group, 37(71.15%) patients were male and 15(28.84%) patients were female. 30(57.69 %) patients were belongs to the urban and 22(42.31%) patients were from rural community. All patients (100%) presented with cough with expectoration. This is followed by loss of appetite 50 (96.15 %), fever 48 (92.30 %) and chest pain 24 (46.15 %), hemoptysis was present in 12 (23.07 %) patients. Out of 52 patients, 30(57.69 %) has taken unsupervised treatment (non-DOTS) and 22 (42.30 %) patient has taken supervised treatment (DOTS) .

Out of 52 patients 23(44.23 %) were relapse, 22(42.30 %) were treatment failure and 7(13.46) were defaulter. Treatment failure cases were more in unsupervised group 28.84% compare with supervised group 13.46%, relapse were more in supervised group 26.9%, as compared to unsupervised group 17.3% and defaulter were more in unsupervised group 11.5%, as compare to supervised group 1.96% (Table 2).

In present study nine patients (17.6%) who took supervised treatment previously were susceptible to all tested drug as compare to unsupervised group in which 3(5.9%) cases were susceptible to all tested drug. 6(11.76%) cases were single drug resistance in supervised group as compared to unsupervised in which 7(13.72%) cases were single drug resistance. Poly resistance were more 12 (23.53%) in unsupervised group as compare-

Table 1. Distribution of patient according to the age

Age group	No. of patients	Percentage %
15-25	20	38.46
26-35	9	17.3
36-45	8	15.38
46-55	7	13.46
56-65	5	9.61
66-75	3	5.76

Table 2: Patients categorized according to previous treatment outcome among supervised and unsupervised

Outcome of previous treatment	Supervised (%)	Unsupervised (%)	Total(%)
Treatment failure	07(13.46%)	15(28.84%)	22(42.30)
Relapse	14(26.90%)	09(17.3%)	23(44.23)
Defaulter	01(1.96%)	06(11.53%)	07(13.46)
Total	22(42.30)	30(57.70)	52(100)

P value <0.05, $\chi^2=6.49$, Significant

Table-3: Evaluation of drug resistance pattern among supervised and unsupervised previous treatment

Pattern of Resistance	Supervised	Unsupervised	%
Susceptible to all tested drugs	9 (17.6%)	3 (5.90)	23.52
Mono Resistance	6 (11.76%)	7 (13.72%)	25.49
Poly Resistance	4 (7.84%)	12 (23.53%)	31.37
Multi-drug Resistance	3 (5.90%)	8(13.72%)	19.6
Total	22	30	100%

P value <0.05, $\chi^2=8.31$, Significant

Table 4: Evaluation of two drug Resistance pattern

Pattern of two drug resistance	No. of patient	Percentage %
H+R	1	1.96
H+Z	2	3.92
H+E	4	7.84
R+S	1	1.96
Z+S	1	1.96
E+S	1	1.96
Total	10	19.6

to supervised group in which 4(7.84%) cases were poly resistance. Multi drug resistance cases were more 7(7.84%) cases in unsupervised group as compare to supervised group in which 3(5.90%) cases were multi drug resistance. (Table 3)

Out of 51 patient 10 (19.6%) patients were two drug resistance. The most common two drug combination pattern was isoniazid and ethambutol in 4(7.84%) patients followed by isoniazid and Pyrazinamide in 2(3.92) patients and in 1(1.96%) patients each of HR, RS, ZS and ES. One patient (1.96%) was Multi-drug Resistant Tuberculosis. (Table 4)

Discussion:

The present study was under taken to evaluate the acquired drug resistance pattern in previously treated patients. The present study includes 52 patients. Culture was done in all these patients by radiometric method. Sensitivity was done in 51 patients for the five first line drugs.

Maximum cases 29(55.76%) were in age group (15-35) year as observed by Desiree TB D'souza [4] 66%. Males 37 (71.15%) predominate over female as observed by Desiree TB D'souza 60%. Out of 52 cases 30 (57.69%) belong to urban areas while 22 (42.30%) to rural area. More number of urban cases is due to the tertiary care centre facility.

Nine patients (17.6%) who took supervised treatment previously were susceptible to all tested drug as compare to unsupervised group in which 3(5.9%) cases were susceptible to all tested drug. 6(11.76%) cases were single drug resistance in supervised group as compared to unsupervised in which 7(13.72%) cases were single drug resistance. Poly resistance were more 12 (23.53%) in unsupervised group as compare to supervised group in which 4(7.84%) cases were poly resistance. Multi drug resistant cases were more 7(7.84%) cases in unsupervised group as compare to supervised group in which 3(5.90%) cases were multi drug resistance.

Anuradha B concluded in our study that acquired resistance to isoniazid was in 18(9.2%) cases rifampicin resistance was in 14(7.2%), Ethambutol resistance was in 8(4.1%) cases and streptomycin resistance was in 9(4.6%) acquired Multi drug resistant tuberculosis cases was in 11 (5.6%) cases. [5] Javed A Malik et al (2008) [11] concluded from our study that of the 69 patients 20 (28.9%) were resistant to one or more than one drug, 49(71.1%) were susceptible to all tested drugs. Multi drug resistant tuberculosis strain was found in 17(24.6%) cases and other drug resistance in 3(15%). [6] Janmeja concluded from our study that in 200 patients of treatment failure, 75% revealed resistance to one or more anti tuberculosis drug. Resistance to isoniazid was observed in 72% cases it was 49% for rifampicin and 73% for

streptomycin, multi drug resistance tuberculosis was seen in 59% cases^[7]. Malhotra B et al (2002)^[13] concluded from our study that acquired drug resistance was detected in 22/78 (28.2%) to rifampicin, in 31/78(39.7%) to isoniazid and in 19/78 (24.3%) for both.^[8]

Desiree TB D'souza concluded from our study that a high proportion of Multi drug resistant tuberculosis and polyresistance 41% and 26% respectively was observed in previously treated cases, mono resistance to isoniazid was in 7% cases, rifampicin was in 2% case and for pyrazinamide was in 4% cases.^[4] Data documented at TUBERCULOSIS RESEARCH CENTRE Chennai from 443 cat II patients revealed that the prevalence of Multi drug resistant tuberculosis was 11.7%.

Multi drug resistant tuberculosis strain present in range between 9.2% to 41%. Our results lies between this range i.e. 19.6%. Present study results were comparable with the study of Mathur B (24.3%) and Dam. T(14%).^[9] Present study results was higher than the study of Saha(9.2%).^[6] Our results are lower than Deivanayagan^[10] and Desiree TB D'souza.^[4]

Conclusion: It was concluded that supersized strategy was superior to(p value <0.05) unsupervised treatment in controlling the tuberculosis infection and in preventing the emergence of drug resistance tuberculosis. Although a well-administered directly observed treatment strategy is the best method of preventing drug resistance and eventual treatment failure, it may not adequately treat resistant case. There is an urgent need for timely identification of suspect of Drug resistance by early referral for culture and Drug sensitivity test for prompt initiation of appropriate treatment to improve outcome as well as to sever the chain of transmission In present study nine patients (17.6%) who took supervised treatment previously were susceptible to all tested drug as compare to unsupervised group in which 3(5.9%) cases were susceptible to all tested drug. 6(11.76%) cases were single drug resistance in supervised group as compared to unsupervised in which 7(13.72%) cases were single drug resistance. Poly resistance were more 12 (23.53%) in unsupervised group as compare to supervised group in which 4(7.84%) cases were poly resistance. Multi drug resistance cases were more 7(7.84%) cases in unsupervised group as compare to supervised group in which 3(5.90%) cases were multi drug resistance.

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References:

1. Surendra K. Sharma, Alladi Mohan. Tuberculosis 1st Edition 2001. Jaypee Brother Medical Publisher (P) Ltd. New Delhi, India
2. Pabloz-Mendez A, Raviglione MC, Laszle A. Binkin N, Rieder HL, Bustreo F. et al. Global surveillance for anti tuberculosis- drug resistance 1994-1997. N Eng J Med. 1998, 338: 1641-9..
3. Espinal M. Raviglione M, Kochi A. Rational DOTS plus for the control of Multi drug resistance International J tuberculosis and lung disease 1999; 3: 561-3.
4. Desiree TB D'souza, Nerges F Mistry et al. High level of multi drug resistant tuberculosis in new and treatment failure patients from the revised national tuberculosis control programme in an urban metropolis (Mumbai) in Western India. BMC Public health 2007Vol. 10, 1186/1471 2458-9-211.
5. Anuradha B et al. Prevalence of drug resistance under the DOTS strategy in Hyderabad. South India, 2001-2003. International Journal of tuberculosis and lung disease 2006 Jan, 10(1): 58-62.
6. Javed A. Malik et al. Study of anti mycobacterium drug resistance in pulmonary tuberculosis in Kashmir, India Jr. for the Practicing Doctor Vol. 5 No 4 2008-09.
7. Janmeja AK. Raj B. Acquired drug resistance in tuberculosis in Haryana. J assoc. Physician India 1998 Feb, 46(2) 194-8.
8. Dam. T, M. Isa, and M. Bose et al. Drug sensitivity profile of clinical mycobacterium tuberculosis isolates-a retrospective study from a chest disease institute India. Journal of Medical microbiology 2005, 54 269-271.
9. Saha AR, Agarwal SK, Saha KV. Study of drug resistance in previously treated tuberculosis patient in Gujarat, India (2000-2001). International J. of Tuberculosis and Lung disease 2002, 6 (12) 1098-1101.
10. C.N. Deivanayagam et al. (1997-2000). Prevalence of acquired Multi drug resistance TB and HIV co-infection. Indian J. Chest Disease Allid. Sci. 2002, 44: 237-242.

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A Study on Nutritional Status of Adolescent Girls and their Consciousness about Body Image.

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Abstract

Background and Objectives: Adolescent girls are future mothers. Nutritional status is important determinant of their physical growth and development, which in turn determines the reproductive outcome. Body image is a psychological construct that is part of self-image. The present study on adolescent girls was conducted to assess their nutritional status of adolescent girls and degree of dissatisfaction and misconception about their body image. **Materials and Methods:** A Community based cross sectional observational study was conducted among 490 late adolescent girls of age group 15-19 years in the urban field practice area of Chitradurga. Subjects were interviewed after obtaining verbal consent. BMI is calculated by measuring height and weight. **Results:** Majority (50.82 %) of subjects belonged to lower Socio economic class, 78% were Hindus and 5.31% of the girls were married. Majority of adolescent girls (53.06%) were underweight followed by normal (45.51 %), overweight (1.02 %) and obese (0.41 %). There was statistically significant association between nutritional status and type of diet. More than half (55.92%) of the girls over estimated their own body weight and only 10.99% of girls underestimated. Majority of the adolescent girls 81.43% of the girls were satisfied and only 18.57% of girls were not satisfied with their body image. There was statistically significant association between consciousness about body image and nutritional status of adolescent girls. **Conclusion:** In the present study, nutritional status of adolescent girls appeared to be poor. Large numbers of girls are dissatisfied with their body image. Girls of urban areas and even from slums are unconstructively apprehensive about slim figure. It is posing a detrimental threat to their health and nutritional status.

Key-words: Adolescent girls, nutritional status, body image.

Introduction

The origin of the word Adolescence is from Greek Latin word, 'Adolescere' which means to grow or to grow to maturity.¹ Adolescence is the transition stage between childhood and adulthood of a person and it is broadly considered as the ages 10 to 19. The adolescence period is an important stage in everybody's life as it prepares a child for its adulthood life. However, the age from 15 to 19 is considered more crucial as far as the growth, mental maturity and development of reproductive system including health and nutritional status of individuals is concerned. For proper physical, mental, and psychological growth, a person needs increased nutrition, health care and social support during this period.

Based on the NFHS IV data of it is estimated that the adolescents between 15-19 years account for about 10 percent of the total population in different parts

of India.² Adolescent girls constitute about 1/5th of total female population in the world.

Among adolescents, girls are doubly vulnerable, have lower priority, relatively neglected in family, should be given more attention as they are future mothers.³ Since majority of adolescent girls especially represent underprivileged section of the society and are undernourished with maladies like preference for male child, incidence of early marriages and high rates of maternal mortality.⁴

Adolescent girls are future mothers. Nutritional status is important determinant of their physical growth and development, which in turn determines the reproductive outcome. Health education and nutritional supplementation is important in this regard. Action is required to improve the same.

Undernutrition renders adolescents vulnerable to disease and early death and has lifelong health consequences. In adolescent mothers, undernutrition not only contributes to increased morbidity and mortality associated with pregnancy and delivery, but also to increased risk of delivering low birth-weight babies. This contributes to the intergenerational cycle of malnutrition.

Body image is a psychological construct that is part of self-image. Issues regarding body weight, general attractiveness, breast size, complexion and acne are some of the main body image concerns for adolescent girls (Aishwarya Rai Syndrome).⁵

The present study on adolescent girls was conducted to assess their nutritional status of adolescent girls and degree of dissatisfaction and misconception about their body image.

Materials and Methods

A community- based descriptive cross- sectional observational study was carried out among girls in the age group of 15-19 years from the urban field practice area of Chitradurga. Urban health training centre caters services to the population of 31186. There were 30 Anganawadi centers in UHTC area. The data collection was carried out for one year from Nov 2015- Oct 2016.

Adolescent girls in the age group of 15-19 years residing in urban field practice area were included in the study after taking informed consent. The sample size was calculated by taking the proportion of late adolescent girls as 5 % according to NFHS IV with 95% confidence level and 4 % absolute precision sample size comes as 450.4 considering the 5-10% of non- response rate the sample size was 490.

It was decided to take 16 study subjects from each Anganawadi area. A central point in each Anganawadi area was identified and the direction of the first house was selected randomly. The process helped in selecting the first house. Subsequently, house to house search was done, and if any adolescent girl was found in the house, it was included in the study. If there were more than one subject in a single house, a listing of the girls was done on the back of the paper and the numbers of a currency note was used to select only one girl in the study. The verbal consent of the subjects was taken before the interview. The survey information included socio-demographic profile, anthropometric measurements.

Measurements: (i) Height: Total standing height was measured with the help of measuring tape. Respondent was asked to stand straight without footwear on a flat floor with parallel feet; while heels, buttocks and shoulders and back of the head touching the wall. The head was held comfortable erect with lower border of the orbit in the same plane as that of the external auditory meatus. Hands were hanging by the sides. A wooden scale was gently applied crushing hair-making contact with the top of the head and height was recorded to

nearest 0.1 cm. (ii) Weight: Adolescent girls were weighed bare foot. Weight was recorded by using portable weighing machine. These girls were asked to stand in the centre of the machine, with body weight evenly distributed between both feet. Weight was recorded to nearest 0.5kg.

Body mass index (BMI) was subsequently computed by formula weight (kg)/height (m²).The anthropometric nutritional status was assessed by “BMI for age” and “height for age” as per WHO standards. The subjects with BMI for age below 5th percentile were categorized as thin and those with “height for age” less than 3rd percentiles were considered to be stunted.

Results

A total of 490 adolescent girls were interviewed. The mean age of the subjects was 15.8+ 0.8 years and more than 50% of the girls belonged to 15-16 years of age group. Majority (77.96%) of the subjects was Hindus, 50.82 % of them belonged to class V socio- economic status and 93.67% belonged to nuclear family. Majority of the girls were studying in P.U College (45.71%). About 9.6% of adolescent girls had dropped out of school with the main reasons being marriage (38%) and not interested in schooling (25%). In the present study 5.31% of adolescent girls were married. The mean age at marriage was 17.5 ± 1.29 years. Mean age at first pregnancy was 18.23 + 0.9 years.

Table 1: Socio demographic variables of the study subjects

Socio demographic variable		Number	Percentage
Religion	Hindu	382	77.96
	Muslim	108	22.04
Education	High School	196	40
	P.U. College	224	45.71
	Studying Degree	70	14.29
Type of family	Nuclear Family	459	93.67
	Joint Family	23	4.69
	Three generation Family	8	1.63
Socio Economic Status *	Class I	134	27.35
	Class II	28	5.71
	Class III	15	3.06
	Class IV	64	13.06
	Class V	249	50.82
Marital status	Unmarried	464	94.69
	Married	26	5.31

*Modified Kuppusswamy Classification

Table 2: Distribution of respondents according to the BMI

BMI	Number	Percentage
Underweight (< 5 th percentile)	260	53.06
Normal (5 th to 85 th percentile)	223	45.51
Overweight (85 th to 95 th percentile)	5	1.02
Obesity (>95 th percentile)	2	0.41
Total	490	100

Majority of adolescent girls (53.06%) were underweight followed by normal (45.51 %), overweight (1.02 %) and obese (0.41 %).

Table 3: Association between nutritional status and type of diet in adolescent girls.

Type of Diet	Nutritional status			
	Underwt	Normal	Overwt	Obese
Mixed	80 (44.4%)	97 (53.9%)	3 (1.7%)	0 (0.0%)
Vegetarian	180 (58.1%)	126 (40.6%)	2 (0.6%)	2 (0.6%)
Total	260 (53.1%)	223 (45.5%)	5 (1%)	2 (0.4%)

Chi-square=10.696; d.f =3; p = 0.013

The present study shows that there is statistically significant association between nutritional status and type of diet. Majority of vegetarians were underweight compared to those having mixed diet.

Table 4: Consciousness and attitude towards current body image

Characters	Number	Percentage
Body Image	Thin	36 7.35
	Normal	399 81.43
	Overweight	55 11.22
Discrepancy in weight	Under estimated	54 11.02
	Correct	162 33.06
	Over estimated	274 55.92
Satisfaction	Satisfied	399 81.43
	Dissatisfied	91 18.57

The above table shows that 7.35 % of the girls perceived themselves as thin, 81.43 % as normal and 11.22 % as overweight .More than half (55.92%) of the girls over estimated their own body weight and only 10.99% of girls underestimated. Majority of the adolescent girls 81.43% of the girls were satisfied and only 18.57% of girls were not satisfied with their body image.

Table 5: Association between consciousness about body image and nutritional status of adolescent girls

Consciousness About body image	Nutritional status		
	Underweight	Normal	Total
Satisfied	277(69.4%)	122(30.6%)	399(100%)
Dissatisfied	52(57.1%)	39(42.9%)	91(100%)
Total	329(67.1%)	161(32.9%)	490(100%)

Chi-square = 5.066; d.f =1; p = 0.024

The above table shows that 81.43 % of the girls were satisfied with their body image and 18.57 % of girls were dissatisfied. There was statistically significant association between consciousness about body image and nutritional status of adolescent girls.

Discussion

In our study majority (53.06%) of the adolescent girls were undernourished and only 0.41% were obese. A.S.Indupalli ⁶ observed that 27.6% of adolescent girls were suffering from chronic energy deficiency and 72.4% were nutritionally normal, while no one was overweight. Shahid *et al.* ⁷ conducted a study in Pakistan among adolescent girls and results revealed that 20% of girls had BMI <18.5 and 3% were obese.

The high prevalence of malnutrition in our study might be because most of the girls were from the lower socio economic status. Gender based discrimination in distribution of and access to food within the family could be the strong factor in undernutrition.

In these countries more than one fifth of adolescent girls were overweight. Where as in our study the prevalence of overweight was very less. Lifestyle changes related to high fat diet, junk foods and low levels of physical activity results in high prevalence of overweight and obese adolescents.

Both under nutrition and obesity or overweight are problems among adolescents. Under nutrition renders adolescents vulnerable to disease and early death and has lifelong health consequences. In adolescent mothers, under nutrition not only contributes to increased morbidity and mortality associated with pregnancy and delivery, but also to increased risk of delivering low birth-weight babies. This contributes to the intergenerational cycle of malnutrition.

In our study it was observed that there was statistically significant association between nutritional status and type of diet. Majority of vegetarians was underweight compared to those having mixed diet.

Adolescent growth and development is closely linked to the diet they receive during childhood and adolescence. Adequate nutrition of any individual is determined by two factors. The first is the adequate availability of food in terms of quantity as well as quality, which depends on

socioeconomic status, food practices, cultural traditions, and allocation of the food. The second factor is the ability to digest, absorb, and utilize the food.

In our study more than half (56.04%) of the girls overestimated their own body weight and only 10.99% of girls underestimated. In a study among adolescent girls in Uttar Pradesh 32.8% of girls had overestimated their weight, while only 4.9% of girls had underestimated their body weight. This indicates the misconception about their body weight.⁸

In our study it was observed that 81.43 % of the girls were satisfied with their body image and 18.57 % of girls were dissatisfied. A study in Lucknow on adolescent girls showed that 73.4% of girls were satisfied with their body image and 26.6% were dissatisfied.⁸

In our study more adolescent girls were satisfied with their body image. Higher levels of body satisfaction are associated with higher levels of self-esteem.

Body image is a psychological construct that is part of self-image. Issues regarding body weight, general attractiveness, breast size, complexion and acne are some of the main body image concerns for adolescent girls (Aishwarya Rai Syndrome).⁵

Its importance increases as young people become more body conscious with the physical changes associated with puberty. Body satisfaction generally decreases with increasing age.

The present study shows that there is statistically significant association between consciousness about body image and current nutritional status of adolescent girls.

A study by Priya D *et al.*⁹ on body image satisfaction among female medical students about observed that 48% of the underweight females were satisfied while 52% were not satisfied with their body image perception. Among the 111 females with the normal BMI, around 77.5% were satisfied while 22.5% were not satisfied with the image. The proportion of females not satisfied with the image was higher with the overweight females. This difference was found to be statistically significant similar to our study.

In a study by Swati *et al.*⁸ on consciousness of adolescent girls, 32.8% were found underweight among those satisfied with their body image.

Negative body image may produce a deep sense of inferiority, anxiety, depression, withdrawal and thoughts of suicide. Adolescents may spend a lot of money, effort and time caring for and beautifying their bodies and yet not be satisfied with the results!

Conclusion: The results of study conclude that majority of the girls were underweight and the desire to become thin are higher in those who already perceived their body image as too thin. Large numbers of girls are dissatisfied with their body image. Girls of urban areas and even from slums are unconstructively apprehensive about slim figure. It is posing a detrimental threat to their health and nutritional status. These findings suggest an urgent need to encourage adolescent girls for maintaining healthy weight and dietary habits through all possible channels.

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References

1. Sathyavathi K, Agarwal KN. Review on adolescent growth studies. Part A. Physiological aspects and environmental factors. *Indian Pediatr* 1979; 16:197-205.
2. National Family Health Survey, India 2015-2016 (NFHS-4)
3. Ghai OP, Gupta P, Paul VK. *Essential pediatrics*, 8th edi. New Delhi: CBS Publishers & Distributors; 2013.
4. Patnekar PN, Bhav S; Bombay branch of Indian Academy of Paediatrics. *The girl child in India: Issues and perspectives*, 1st edi. Bombay: M K Offset; 1990.
5. K Park. *Text book of Preventive and social Medicine*. 24th edition, Jabalpur: Banarsidas Bhanot Publication, 2017.
6. A. S. Indupalli. Health Status of Adolescent Girls in an Urban Community of Gulbarga District, Karnataka. *Indian J Public Health* 2009; 53(4): 232
7. Shahid A, Siddiqui F.R, Bhatti M.A, Ahmed M, Khan M.W. Assessment of Nutritional Status of Adolescent College Girls at Rawalpindi 2009; 15(1):11-5.
8. Dixit S, Agarwal G G, Singh J V, Kant S, Singh N. A study on consciousness of adolescent girls about their body image. *Indian J Community Med* 2011; 36:197-202.
9. D Priya, K S Prasanna, S Sucharitha, Nafisa C Vaz. Body Image Perception and Attempts to Change Weight among Female Medical Students at Mangalore. *Indian J Community Med* 2010;35(2):316-9.

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Study on lifestyle risk factors in school children and its relationship to their mothers'**Laghima.V.N.¹ Sobha George² Nimitha Paul³**¹Final year MBBS student, ² Assistant Professor, Community Medicine Department, ³ Lecturer(Biostatistics), Community Medicine Department, Amrita Institute of Medical Sciences, Amrita University, Kochi, India.**Date of Submission** : 18-08-2017**Date of online Publication** : 27-10-2017**Date of Acceptance** : 22-10-2017**Date of Print Publication** : 31-12-2017**Address for correspondence** : Dr. Sobha George, Kulirankal, Padamugal, Kakkanad, Kochi, Pin-682030. E-mail: sobhageorge@aims.amrita.edu**Abstract**

Introduction: Globally Non Communicable Diseases (NCDs) are a major cause of morbidity and mortality. They occur after exposure to a set of lifestyle risk factors. Obesity and hypertension among adults has its antecedents during childhood. When governments are assessing ways to generate finances for management of NCDs, it is worthwhile to give due importance to preventive services. **Objectives:** To study relationship of lifestyle risk factors (BMI & BP) between school children and their mothers and to study the factors associated with BMI& BP. **Methodology:** School based cross sectional study done among 225 students and their mothers in three settings, rural, tribal and urban. Students and mothers were interviewed using questionnaire in local language after obtaining consent. Height, Weight and BP measured using standardized instruments. Data tabulated using MS excel, analyzed using SPSS version 20. **Results:** There was statistically significant association between BMI of mother and student. Association between BP of mother and student was not statistically significant. Association between BMI and BP was statistically significant among mothers and students. Considering BMI, statistically significant association was noted for physical activity, use of non-smoking tobacco and desire to change weight. Considering BP, desire to change weight, use of non-smoking tobacco and intake of food from outside showed statistically significant association. **Conclusion:** Maintaining normal BMI is important as it is found to affect next generation. Increased BMI is associated with abnormal BP values, which is a precursor for life style diseases. Hence control of BMI and BP is essential to protect future generations from lifestyle diseases.

Key-words: BMI, BP, lifestyle risk factors, non-communicable diseases**Introduction**

Globally Non Communicable Diseases (NCDs) are a major cause of morbidity and mortality. Of the 57 million global deaths in 2008, 36 million (63%) were due to NCDs.¹ The prevalence of NCDs are showing an upward trend in most countries. A progressive rise in the disease pattern of NCD foretells a serious public health issue. Most NCDs occur after a prolonged exposure to a set of lifestyle risk factors. The major risk factors for NCDs are sedentary lifestyle, unhealthy diet, tobacco and alcohol abuse. A large percentage of NCDs are preventable through the changes in these factors. Behavioral risk factors start in childhood and continue into adulthood.

India carries the greatest burden of NCDs globally and Indians develop cardiovascular diseases (CVDs) earlier

with more severity when compared to Westerners.² India is experiencing a rising burden of NCDs, both in urban and rural population, with considerable loss in potentially productive years of life. Childhood and adolescent obesity has emerged as an epidemic in countries that are in rapid epidemiological transition, and India is no exception. According to a study published in Lancet, India is just behind US and China among the countries with highest number of obese people.³ 50-80% of the obese children will continue to be obese adults. A study done on Indian school going children suggests that the prevalence of overweight& obesity varies remarkably with different socioeconomic development levels.⁴ Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.⁵ A community based survey carried out by ICMR during 2007-2008 to identify the risk factors for NCDs reported a

prevalence of hypertension varying from 17-21% in all the states.⁶

A study done in Kerala revealed a high prevalence of overweight (16%) and obesity (7%).⁷ Kerala stands second in the country after Punjab in child obesity.⁸ Increased prevalence of overweight and obesity emphasizes the need of early recognition of excessive weight gain and early intervention. The prevalence of hypertension among the Kerala State's population was found to be 38.9 per cent in the preliminary analysis of data collected by the Kerala chapter of Cardiological Society of India (CSI). In rural Kerala, traditional risk factors were strongly associated with MI and stroke.

Metabolic risk factors such as obesity are starting to appear at early ages. Body Mass Index (BMI) is the best tool for screening overweight and obesity in children and adults and correlates with all-cause mortality.⁹ Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. Public health approaches can effectively slow down the development of atherosclerosis in young people, thereby reducing the likelihood of future epidemics of cardiovascular events. Early detection is key to improving outcomes of CVDs. Prevention of obesity should begin in early childhood. Hypertension (HT) is a major NCD risk factor especially related to CVDs. BP levels have been shown to be positively and progressively related to risk of stroke and CVDs. There is increasing evidence that adult hypertension has its antecedents during childhood and predicts adult BP. Hence tracking of BP can be applied in identifying children at risk of developing hypertension at a future date.

As the magnitude of CVDs continue to accelerate, the pressing need for increased awareness and for strong focused responses is increasingly needed. In the absence of preventive strategies, increasing number of people will succumb to heart attacks due to continuing exposure to risk factors. Hence the studies of life style risk factors are important. There is only limited data on the relationship of obesity and hypertension between mothers and their children. Hence the objective of this study was to compare two important lifestyle risk factors(BMI and BP) between school children in the age group 12-15 years & their mothers, in different socioeconomic backgrounds and to study the factors associated with BMI & BP.

Materials and methods

A school based cross sectional study was done in 3 schools selected by stratified random sampling based on different settings (Rural, Tribal and Urban) during June & July 2015 in Palghat district, Kerala State. Sample size was calculated based on a study done in Bhilai.¹⁰ Accordingly, 225 students (75 students from each school) and their mothers were examined.25 students each from 8th (12-13 yrs), 9th(13-14 yrs)and 10th(14-15yrs)standards of the three schools were taken for the study.Children in

age group of 12-15 years attending school on arranged day of examination along with mothers were included in the study. Those who did not give consent and those not accompanied by mothers were excluded. Face to face interview with student and mother was conducted after getting informed consent using questionnaire adapted from WHO STEPS NCD risk factors survey in local language. Height , weight and BP of both student and mother were measured using standardized instruments. The cuff size was used according to the arm circumference of mother and student. For an arm circumference of 22 to 26 cm, the cuff size of 12 x 22 cm and for 27 to 34 cm, cuff size of 16 x 30 cm was used. Two BP measurements were done and the average was taken. Data was tabulated using MS Excel and analyzed using SPSS version 20. p value of<0.05 was considered to be statistically significant.

Results

Demographic characteristics of the study population are shown in Table No.1. The average age of mothers ranged from 29 to 50 years, with a mean age of 36.68 ± 3.93. The behavioural risk factors of study population are shown in Table No.2.

Table No.I Demographic variables of study population

Variable	Rural	Tribal	Urban
Gender of student			
Male	38(50.7)	36(48)	23(30.7)
Female	37(49.3)	39(52)	52(69.3)
Age of mothers*			
<37 years	52(69.3)	52(69.3)	28(37.3)
≥37 years	23(30.7)	23(30.7)	47(62.7)

*mean age 37 years

BMI of mothers classified according to WHO Asian BMI cut-off points. BMI of students was classified based on Revised Indian Association of Pediatrics growth charts.¹¹ (Table No.3) 36% of mothers in tribal area were underweight. 82.6% of mothers in urban area and 68% in rural area were overweight and above. Among students, 80% of tribals were underweight. Only 4% of tribals belonged to overweight and obese category, while 24% in urban area belonged to that category. Majority of mothers in rural, tribal and urban areas had above normal value for BP. Among students, 16% in urban area, 9.3%in tribal area and 5.3% in rural area had above normal values for BP. Considering previous BP measurements, none of the tribal students have had measured their BP before, while only 1.3% of mothers have had their BP measured before. Considering BMI, there was statistically significant association between BMI of mother and student (p ,0.001). (Table No.4)Association between BP of mother and student was not statistically significant. (p, 0.332)

Table No. 2 Behavioural risk factors of study population

Variable	Rural	Tribal	Urban
MOTHERS			
Intake of food not prepared at home(per week)			
Never	66(88)	72(96)	37(49.4)
Once a week	9(12)	1(1.3)	37(49.3)
More than once a week	0	2(2.7)	1(1.3)
Engagement in vigorous physical activity as part of work			
Yes	46(61.3)	72(96)	46(61.3)
No	29(38.7)	3(4)	29(38.7)
Desire to change weight			
Yes	44(58.7)	6(8)	46(61.3)
No	31(41.4)	69(92)	29(38.7)
Use of nonsmoking tobacco			
Yes	0	55(73.3%)	0
No	75(100%)	20(26.7%)	75(100%)
STUDENTS			
Intake of food not prepared at home(per week)			
Never	59(78.6)	72(96)	41(54.7)
Once a week	13(17.3)	3(4)	28(37.3)
More than once a week	3(4)	0	6(8)
Engagement in vigorous games			
Yes	55(73.3)	52(69.3)	28(37.3)
No	20(26.7)	23(30.7)	47(62.7)
Desire to change weight			
Yes	42(56)	7(9.3)	41(54.7)
No	33(44)	68(90.6)	34(45.3)
Use of non-smoking tobacco			
Yes	0	2(2.7%)	0
No	75(100%)	73(97.3%)	75(100%)

Table No.3. BMI &BP of study population

Variable	Rural	Tribal	Urban	p Value
BMI of MOTHERS				
Underweight	3(4)	27(36)	2(2.7)	<0.001
Normal	21(28)	33(44)	11(14.7)	
Overweight& above	51(68)	15(20)	62(82.6)	
BMI of STUDENTS				
Underweight	51(68)	60(80)	37(49.3)	0.001
Normal	16(21.3)	12(16)	20(26.7)	
Overweight& above	8(10.7)	3(4)	18(24)	
BP of MOTHERS				
Normal value	21(28)	21(28)	16(21.3)	0.559
Above normal value	54(72)	54(72)	59(78.7)	
BP of STUDENTS				
Normal value	71(94.7)	68(90.7)	63(84)	0.093

Above normal value	4((5.3)	7(9.3)	12(16)
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Table No.4 Association between BMI of mother and student

BMI of STUDENT	BMI of MOTHER		
	Underweight	Normal	Overweight&above
Underweight	28(18.9)	50(33.8)	70(47.3)
Normal	3(6.2)	10(20.8)	35(72.9)
Overweight&above	1(3.4)	5(17.2)	23(79.3)

Table No. 5 Association between BMI & BP

BMI of mother	BP of mother		p value
	Normal BP	Above normal BP	
Underweight	13(40.6)	19(59.4)	
Normal	24(36.9)	41(63.1)	0.001
Above normal	21(16.4)	107(83.6)	
BMI of student	BP of Student		p value
	Normal BP	Above normal BP	
Underweight	141(95.3)	7(4.7)	<0.001
Normal	43(89.6)	5(10.4)	
Above normal	18(62.1)	11(37.9)	

The association between BMI & BP of both mother and student was statistically significant.(p.0.001 & p <0.001)(Table No. 5)

Considering factors associated with BMI ,among mothers, statistically significant association was noted for age(p=0.005),engagement in vigorous physical activity as part of work(p <0.01),duration of sleep(p <0.01) ,use of non-smoking tobacco(<0.001) and above normal BP(p <0.01). Regarding BMI of students, engagement in vigorous games(p <0.01) ,desire to change weight(p <0.011) and above normal BP(p <0.001) showed a statistically significant association.(Table No.6)

Considering the factors associated with BP of mothers, desire to change the weight(0.038) and use of non-smoking tobacco(p=0.039) showed a statistically significant association while among students intake of food not prepared at home(0.037) showed a significant association. (Table No.7)

On binary logistic regression above normal BP, physical inactivity, use of smokeless tobacco, less duration of sleep are predictors of increased BMI of mothers while above normal BP and no desire to change weight are predictors of increased BMI of students. Regarding BP, for mothers the age and for students no engagement in vigorous games are predictors .(Table No. 8)

DiscussionIn the present study it is seen that there is a statistically significant association between BMI of mother and BMI of students regardless of rural, tribal or

Table No.6 Factors associated with BMI of mothers & students

Variables	BMI OF MOTHERS			p value
	Underweight	Normal	Overweight & above	
Age of mother				
<37 years	25(18.9)	43(32.6)	64(48.5)	0.005
≥37 years	7(7.5)	22(23.7)	64(68.8)	
Engagement in vigorous physical activity as a part of work				
Yes	28(17.1)	58(35.4)	78(47.6)	<0.01
No	4(6.6)	7(11.5)	50(82)	
Duration of sleep				
5 -7 hours	5(4.3)	26(22.2)	86(73.5)	<0.01
>7 hours	27(25)	39(36.1)	42(38.9)	
Use of non-smoking tobacco				
Yes	22(40)	26(47.3)	7(12.7)	<0.001
No	10(5.9)	39(22.9)	121(71.2)	
BP of mother				
Normal BP	13(40.6)	24(36.9)	21(16.4)	<0.01
Above normal BP	19(59.4)	41(63.1)	107(83.6)	
BMI OF STUDENTS				
Gender				
Male	70(72.2)	16(16.5)	11(11.3)	0.2
Female	78(60.9)	32(25)	18(14.1)	
Engagement in vigorous games				
Yes	105(77.8)	20(14.8)	10(7.4)	<0.01
No	43(47.8)	28(31.1)	19(21.1)	
Desire among students to change their weight				
Yes	53(58.9)	18(20)	19(21.1)	0.011
No	95(70.4)	30(22.2)	10(7.4)	
BP of student				
Normal BP	141(95.3)	43(89.6)	18(62.1)	<0.001
Above normal BP	7(4.7)	5(10.4)	11(37.9)	

urban backgrounds. A study done by Poonam Marwah in Patiala, Punjab also has reported that a family history of obesity is a significant risk factor for obesity in children.¹² Another study by Ramesh K reported a strong association of overweight with family history.¹³

Gender was not significantly associated with BMI of students according to this study. A study done by A Jahnvi among high school students of Hyderabad showed that the prevalence of overweight was higher in boys.¹⁴ Another study done by Shiny George in Kerala reported that BMI was higher in boys than girls.⁷ It also recommended that consumption of high fat and high energy food should be avoided by children. This study

also showed a significant association with BP and intake of food not prepared at home.

Table No.7 Factors associated with BP of mothers & students

Variables	BP OF MOTHER		p value
	Normal BP	Above normal BP	
Age (*mean age 37 years)			
<37 years*	45(34.1)	87(65.9)	0.001
≥37 years	13(14)	80(86)	
Type of family			
Nuclear	36(24.8)	109(75.2)	0.661
Joint	22(27.5)	58(72.5)	
Engagement in vigorous physical activity as a part of work			
Yes	44(26.8)	120(73.2)	0.554
No	14(23)	47(77)	
Desire among mothers to change their weight			
Yes	18(18.8)	78(81.2)	0.038
No	40(31)	89(69)	
Use of non-smoking tobacco			
Yes	20(36.4)	35(63.6)	0.039
No	38(22.4)	132(77.6)	
BP OF STUDENT			
Gender			
Male	85(87.6)	12(12.4)	0.354
Female	117(91.4)	11(8.6)	
Engagement in vigorous games			
Yes	125(92.6)	10(7.4)	0.088
No	77(85.6)	13(14.4)	
Intake of food not prepared at home(per week)			
Never	158(91.9)	14(8.1)	0.037
Once a week	38(86.4)	6(13.6)	
More than once a week	6(66.7)	3(33.3)	
Desire among students to change their weight			
Yes	80(88.9)	10(11.1)	0.719
No	122(90.4)	13(9.6)	

In this study, students with BMI of underweight category were found to be more in rural area than urban area, while overweight was more in urban students when compared to students in rural area. A study done by P Alok in Surat pointed out the increasing prevalence of overweight and obesity in urban adolescents.¹⁵

Desire to change weight had statistically significant association with BMI of students as shown in this study. A study reported by R P Menon mentions that creating awareness about risks of overweight should remain a priority area of intervention.¹⁶ Another study done by

Ambili Remesh in Trivandrum, Kerala concluded that creating awareness among school goers on the negative health effects of obesity is the key for maintaining good health.¹⁷

Table No.8 Predictors of BMI&BP -binary logistic regression

Variable	Adjusted OR	95% CI
BMI of Mother		
Above normal BP	2.6	1.32-5.12
Physical inactivity	2.9	1.33-6.6
Use of smokeless tobacco	8.4	3.16-22.3
Less duration of sleep(<7hours)	2.3	1.09-4.76
BMI of student		
Above normal BP	16.42	5.25-51.31
No desire to change weight	6.21	1.19-32.26
BP of mother		
Age \geq 37 years	1.7	1.02-2.92
BP of student		
No engagement in vigorous games	2.6	1.16-5.9

BMI & engagement of students in vigorous games were associated in this study. This is similar to a study done by Shiji K Jacob in Kochi which revealed that the prevalence of obesity is now increasing and the causes are dense food and reduced exercise.¹⁸

BMI of mothers & duration of sleep were significantly associated in this study. According to a study done by Shiny George in Kerala, among the influencing factors sleeping time and fast food were found to be significant.⁷

This study showed use of nonsmoking tobacco products among tribal mothers and students. A study done by Palash Jyoti Misra among tribal people in Assam also reported high use of tobacco products. Tobacco use, alcohol use and unhealthy diet habits were high in that population and were major NCD risk factors.¹⁹ In this study, a significant association between BMI of mothers and use of nonsmoking tobacco products has been seen.

According to this study, the association between BP of mother and BP of student was not found to be statistically significant. In this study, BP among students was measured only in a narrow age group, 12-15 years, due to feasibility purposes. Among students, 16% in urban area, 9.3% in tribal area and 5.3% in rural area had above normal values for BP measurement. In a study done in Kolkata by Partha Chakraborty, 1.53% of hypertension was reported in urban schools and 70.37% were from adolescent age group.²⁰

The association of BP and use of non-smoking tobacco was found to be statistically significant in this study. A

study done by Palash Jyoti Misra among tribal people in Assam also supported this.¹⁹

Conclusion

Study on lifestyle risk factors in school children and its relationship to their mothers' was a study done to understand the association of BMI & BP between school children in the age group 12-15 years & their mothers in different socioeconomic backgrounds and to study the factors associated with BMI & BP.

There was a statistically significant association between BMI of mother and student This points to the importance of maintaining a normal BMI as it is found to affect the next generation also. The association between BMI & BP of both mother and student was statistically significant.. An increased BMI is associated with abnormal BP values, which is a precursor for life style diseases. Hence maintaining a normal BMI in children is essential to protect the future generation from lifestyle diseases.

Physical inactivity and no desire to change weight are associated with increased BMI. Vigorous physical activity should be promoted among students as it helps to have a normal BMI. Students should be educated about the harmful effects of overweight so that a desire to change weight can be made which will prevent overweight. This should be done through campaigns against obesity in the schools. Follow up of overweight and obese students should be done to monitor their progress.

None of the tribal students had measured their BP before, while only 1.3% of mothers had their BP measured before. The importance of checking BP should be stressed in the tribal population and measures should be taken for tracking of BP .

The limitation of the study is that the BMI of students may be influenced by paternal characteristics also which was not measured in this study due to feasibility purposes.

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References :

- 1 WHO (2011), *Global status report on non-communicable diseases 2010*.
- 2 Xavier D, Pais P, Devereaux PJ, Xie C, Prabhakaran D, Reddy KS *et al*. Treatment and outcome of acute coronary syndrome in India (CREATE): a prospective analysis of registry data. *Lancet*.2008April 26;371;(9622):1435-42
- 3 1 in 5 Indians obese: The Lancet study-The HealthSite.com 2 Jan 2015.

- 4 Goyal RK, Shah VN, Saboo BD, Phatak SR et al. Prevalence of overweight & obesity in indian adolescent school going children:its relationship with socioeconomic status & associated lifestyle factors. *J Assoc Physicians India* 2010;58:151-8.
5. Gupta R. Trends in hypertension epidemiology in India. *J Hum Hypertens* 2004; 18:73– 78
- 6 Govt. of India(2011), *National Health Report 2011*, Ministry of Health and Family Welfare, New Delhi.
- 7 Shiny George, Jeffy Binu, Biju Baby Joseph. A study on the prevalence of overweight and obesity and its influencing factors in rural adolescent school going children in Kerala, India. *IJCRR* 2012;4(24):89-99
- 8 NFHS 2005-06. Mumbai International Institute for Population Sciences.2007.
- 9 Whitlock G, Lewington S, Sherliker P, et al. Body-mass index and cause-specific mortality in 900,000 adults: collaborative analyses of 57 prospective studies. *Lancet* 2009; 373:1083
- 10 Garvita Jain,SKBharadwaj.Prevalence of overweight and obesity among school children(13-17 yrs)in relation to their socioeconomic status and eating habits.*International journal of Scientific and Research Publications*.2012;2(6):1-4.
- 11 Khadilkar VV, Khadilkar AV. Revised Indian Academy of Pediatrics 2015 growth charts for height, weight and body mass index for 5-18-year-old Indian children. *Indian J Endocrinol Metab*. 2015 Jul-Aug;19(4):470-6
- 12 Poonam Marwah, Asish Marwah, Paramjeet Kaur.Prevalence of overweight and obesity among school children between the ages of 6-15 years in Patiala, Punjab. *Paed Oncall Journal* 2012.9(11)
- 13 Ramesh K. Prevalence of overweight and obesity among high school students of Thiruvananthapuram City Corporation, Kerala. *Australian Medical Journal* 2010,3,10,650-661.
- 14 A Jahnavi, DBN Chandrika, G Sultana et al. Prevalence of overweight and obesity in school going children in Hyderabad. *Pharmanest* 2011;2(4).
- 15 P Alok, P Malay, V Diyeskumar. Prevalence of overweight and obesity in adolescents of urban & rural area of Surat, Gujarat. *National Journal of Medical Research* 2012;2 (3):325-329.
- 16 R P Menon, J Shankar, G M Kadapurath, G Mohan. Prevalence of overweight and obesity in school going children (6 to 15 years) of government and private school children in rural India. *GHF*2010.
- 17 Ambili Ramesh.Prevalence of adolescent obesity among high school students of Kerala. *Archives of Pharmacy Practice* 2012;3(4):289-292
- 18 Shiji K Jacob. Prevalence of obesity and overweight among schoolgoing children in rural areas of Ernakulam District, Kerala.*Indian Journal of Scientific Study* 2014; 2 (1):16-19.
- 19 Palash Jyoti Misra, G K Mini, K R Thankappan.Risk factor profile for non-communicable diseases among Mishing tribes in Assam, India:Results from a WHO STEPS survey. *Indian J Med Res* 2014;370-378.
- 20 Partha Chakraborty, Subhadra Rey, Sumith Kar.Obesity in Kolkata Children:magnitude in relationship to hypertension. *J Nat Sci Biol Med* 2011;2(1):101- 106.

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Birth Preparedness and Complication Readiness For A Safe Motherhood Among Antenatal Women Attending an Urban Health Centre, Bengaluru.

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Abstract

BACKGROUND: Maternal mortality rate continues to be alarming in India. The process of pregnancy needs planning since there can be undue occurrence of emergencies leading to maternal death or morbidity. Care-seeking is compromised because of the delay in deciding to seek care, identifying danger signs, reaching a health facility, receiving adequate and appropriate treatment at the health facility and many more. Birth preparedness and complication readiness is very essential and effective strategy that encourages mother, family and community to plan a safe delivery. **OBJECTIVE:** 1. To assess birth preparedness and complication readiness (BPACR) for a safe motherhood among antenatal mothers attending an urban health centre under Bangalore Medical College and Research Institute. 2. To identify the factors affecting BPACR. **METHODS:** A facility based cross sectional study conducted in Urban Health Training Centre (UHTC) under Bangalore Medical College and Research Institute (BMCRI) between November 2016 to January 2017. The study was conducted among 144 pregnant women as per inclusion criteria by convenient sampling. A semi structured questionnaire was used to calculate socio demographic details, antenatal care and a validated scale on BPACR by Johns Hopkins was used to assess birth preparedness and complication readiness. Descriptive statistics and chi square tests were used to analyze the data. **RESULTS:** Overall BPACR score was 43.98%. Only 18.7% of women knew >8 danger signs of pregnancy. Less than half of them knew about JSY benefits of cash assistance (31.3%) and transportation services (28%). Sociodemographic factors like education, socioeconomic status, husband's education and type of family had statistically significant associations with BPACR components.

Key-words: Birth preparedness, complication readiness, BPACR, antenatal women

INTRODUCTION

Pregnancy is a normal physiological process for a woman that creates happiness and anticipation in her as well as the family and the community. It needs preparation, planning, care, emotional and social support for the welcoming of the new life into the world. However the outcome of pregnancy is unpredictable and a woman can encounter difficulties during antenatal, intrapartum and postnatal period which can lead to maternal morbidity, mortality and also affect the child health.

Maternal mortality ratio (MMR) in 2015 was estimated as 216 per lakh live births globally. This translates into approximately 830 women dying every single day due to

the complications of pregnancy and childbirth. Almost all of these deaths occurred in low resource settings, and most of them are preventable.¹ This is due to inadequate facilities, inappropriate care, lack of emergency preparedness and referral services which are the key components for a safe delivery.²

India has MMR of 167 per lakh live births.³ With this situation, India continues to have maternal mortality as a public health challenge. The primary causes of maternal deaths are haemorrhage (mostly during post partum), pre-eclampsia, eclampsia, sepsis and indirect causes mostly due to interaction between preexisting medical conditions and pregnancy.⁴

A majority of maternal deaths occur during labour, delivery and postpartum within 24 hours. The causes could be medical or socio cultural factors that can delay in care seeking. According to a study done by Thaddeus and Maine, delays can occur at 3 levels

- (1) delay in the decision to seek care;
- (2) delay in the arrival at a health facility; and
- (3) delay in the provision of adequate care.

Delay in identifying danger signs of pregnancy is yet another important factor that leads to complications.⁵ Addressing all these factors is imperative to reduce MMR.

There are several strategies adopted globally such as safe motherhood programmes, strategies toward ending preventable maternal mortality (EPMM) and in India Reproductive and Child Health (RCH II), Janani Suraksha Yojana, etc which aim to lower maternal mortality.⁴ As a result of such programmes, MMR has reduced by 44% (annual reduction of 2.3%) during MDG era. According to SDG, the average global target is an MMR of less than 70 per lakh live births by 2030 and the supplementary national target is that no country should have an MMR greater than 140 per lakh live births. This requires annual reduction rate of 7.3%.⁶

One such interventional tool is Birth Preparedness and Complication Readiness (BPACR) designed by The Maternal and Neonatal Health (MNH) Program of Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO). It is a list of behaviors and skills that addresses factors causing delay at various levels such as the individual, family, community, healthcare provider, health facilities and policy makers to effectively plan the delivery and make pregnancy and postpartum safe for mother and the baby.⁷

BPACR includes the following components:

- a. Knowledge of danger signs
- b. Plan for where to give birth
- c. Plan for a skilled birth attendant
- d. Plan for transportation
- e. A birth companion
- f. Identification of compatible blood donors in case of emergency
- g. Saving money for expenses

There are several studies that have provided evidence that by implementing a feasible tool like BPACR has increased the knowledge of mothers about danger signs of pregnancy, planning the delivery and improved the early care seeking during obstetric emergencies thus promoting the preventive behavior among them and the family members.^{8,9,10}

Many studies have been conducted in rural India on status of BPACR.¹⁰ Although the health services in urban areas have been found to be better compared to rural, the scenario in slums hasn't been much explored. Hence this study has been undertaken to know the BPACR status in antenatal mothers attending urban field practice areas

which largely covers slum dwellers and also to understand the factors that affect BPACR so that effective improvisation can be done in the services addressing the lacunae.

METHODOLOGY

A hospital based cross sectional study was conducted in Urban Health Training Centre (UHTC), field practice area under Bangalore Medical College and Research Institute (BMCRI) after obtaining institutional ethical clearance. The study duration was between November 2016 to January 2017. The population of UHTC has 30,545 which consist of a large proportion of slum dwellers. The outpatient antenatal services are provided on every Monday and Friday in a week.

A similar study (Agarwal et al) was used to calculate sample size where in BPACR was found to be 47.8%. With a relative precision 20%, the sample size was found to be 144.⁹ The study subjects were antenatal mothers in second and third trimester. Those who were in first trimester and who visited health facility for the first time were excluded from the study, the reason being lack of information about components of BPACR. The study subjects were selected by convenient sampling.

Data was collected by interview method after taking an informed consent. A pre tested, semi structured questionnaire was used to collect information about socio demographic profile, parity, husband's details and his participation in antenatal care, care giver's details, etc. A validated BPACR index developed by the Johns Hopkins Bloomberg School of Public Health was used to assess birth preparedness and complication readiness.

BPACR index was calculated from the following indicators:

- Percentage of the women who knew about > 8 danger signs of pregnancy.
- Percentage of the women who knew about financial assistance provided by the Government in Janani Suraksh Yojana (JSY).
- Percentage of the women who knew about transportation provided by the Government in JSY.
- Percentage of the women who availed Antenatal Care in 1st trimester by skilled provider.
- Percentage of the women who identified skilled birth attendant for delivery.
- Percentage of the women who identified mode of transportation.
- Percentage of the women who saved money to pay for expenses.

BPACR index was calculated as $\sum \text{Indicator} / 7$

Data was entered in Microsoft Excel and analyzed in Statistical Package for the Social Sciences (SPSS) version 20. Descriptive statistics used to describe the distribution of all variables. Analytical statistics like Chi square tests was used to find the association between each independent variable and BPACR indicators.

RESULTS

Table 1: Sociodemographic details of the study participants

VARIABLE	FREQUENCY n=144	PERCENTAGE %
AGE GROUP IN YEARS		
<20	31	21.50%
21-29	100	69.50%
>30	13	9.00%
RELIGION		
HINDU	75	52.10%
MUSLIM	65	45.10%
CHRISTIAN	4	2.80%
TYPE OF FAMILY		
NUCLEAR	69	47.90%
JOINT	61	42.40%
THREE GENERATION	14	9.70%
EDUCATION OF WOMEN		
UPTO PRIMARY	19	13.10%
MIDDLE/ HIGH	78	54.10%
PRE UNIVERSITY AND ABOVE	47	32.80%
OCCUPATION OF WOMEN		
UNEMPLOYED	131	91%
UNSKILLED	5	3.30%
SKILLED	4	2.70%
PROFESSIONAL	4	3%
HUSBAND'S EDUCATION		
UPTO PRIMARY	39	27%
MIDDLE/ HIGH	75	52%
PRE UNIVERSITY AND ABOVE	30	21%
HUSBAND'S OCCUPATION		
UNEMPLOYED	9	6.30%
UNSKILLED	47	32.60%
SKILLED	42	29.20%
PROFESSIONAL	44	31.90%
SOCIO ECONOMIC SATUS		
BPL	90	62.50%
APL	54	37.50%

Socio demographic details: A total of 144 subjects participated in the study. Majority (69.5%) of them

belonged to age group of 21-29 years and the mean age of the study subjects is 23.8±3.78 years.

Majority were literates and 78 (54.1%) had studied upto high school, 47 (32.8%) had studied upto pre-university and above. Majority 131(91%) were homemakers and unemployed. More than half 75 (52.1%) belonged to Hindu religion. All of them were in marital relationship. Majority of them 69 (47.9%) belonged to nuclear family. Majority of them 90 (62.5%) belonged to the category of Below Poverty line (BPL) families. The details are depicted in Table 1.

Husband and Caregivers details: All the husbands were literate and more than half (52%) studied up to middle/high school. About 47 (32.6%) were unskilled workers. Majority of the husbands 110 (76.4%) involved themselves in the planning of

birth, 98 (68.1%) of the husbands accompanied their wives during the ANC visit, 121 (84%) provided financial assistance and 126 (87.5%) of them provided moral support to their wives during pregnancy. Majority of the women 115 (79.8%) had care givers like mother, mother-in-law, any of the relative during pregnancy. Out of 115 care givers, 102 (88.6%) were literates and 13 were illiterates (11.3%)

Pregnancy details: As shown in Table 2, about 60 (41.7%) were primigravida, 60 (41.7%) were para one. Majority 92 (63.9%) were in third trimester. Most of them 138 (95.8%) had Mother Child Protection (MCP) card.

Table 2: Pregnancy related details

VARIABLE	FREQUENCY n=144	PERCENTAGE %
PLANNED PREGNANCY		
YES	39	27.10%
NO	105	72.90%
BIRTH ORDER		
PRIMIGRAVIDA	60	41.70%
1	60	41.70%
≥ 2	24	16.60%
CURRENT TRIMESTER		
2	52	36.10%
3	92	63.90%
MCP CARD		
YES	138	95.80%
NO	6	4.20%
TYPE OF PREVIOUS DELIVERY (n=85)		
NORMAL	55	64.70%
CAESSAREAN	30	35.30%

Figure 1: Distribution of ANC services

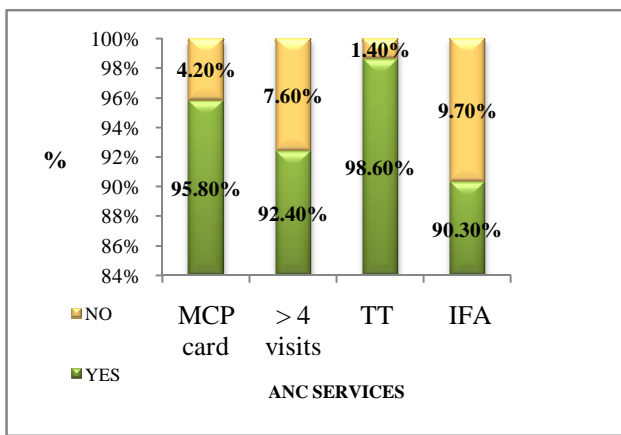
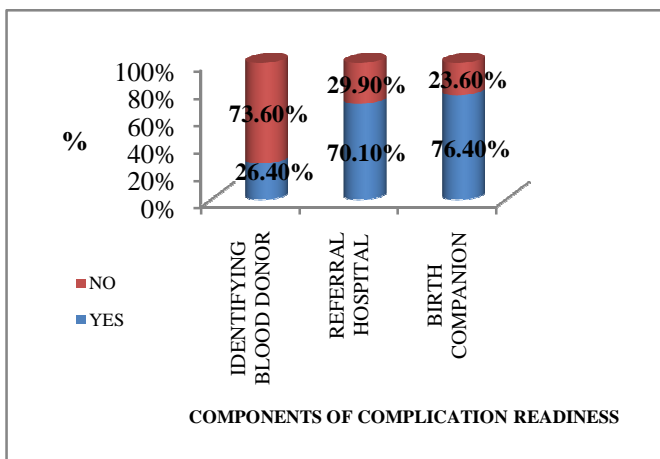


Figure 2: Awareness about complication readiness



Majority of them 127 (88.2%) had registered during first trimester and about 133 (92.4%) have undertaken >4 ANC visits, 142 (98.6%) were aware about Tetanus Toxoid (TT) immunization and 130 (90.3%) were aware about consumption of Iron and folic acid tablets (IFA) as depicted in Figure 1.

BPACR status:

Table 3 shows status of birth preparedness. Most of the women 122 (84.7%) identified skilled birth attendant for delivery, and all planned where to give birth. Approximately 127 (88.2%) of women registered in first trimester and have taken ANC care by skilled provider. About 92 (63.9%) of women identified mode of transportation. More than half 82 (56.9%) of them saved money for expenses. Only 45 (31.3%) had knowledge about financial assistance provided in JSY and less than half 41 (28%) were aware about transportation provided in JSY. The overall BPACR index was calculated to be 43.98%

Knowledge about danger signs of pregnancy: Only about 27 (18.7%) of them knew >8 danger signs of pregnancy and about 21 (14.5%) of them were unaware about any of the danger signs of pregnancy. Most common known danger signs were about severe bleeding, pain abdomen, reduced fetal movements and leaking per vagina. Only 45 (31.2%) of them knew about danger

Table 4: Association between sociodemographic variables and BPACR components

Variable	BPACR components		Total (100%)	Chi square value
	NO	YES		
1. > 4 ANC visits				
Education of women				
Primary school and below	4 (21.1%)	15 (78.9%)	19	0.04 (S)
Middle/ High school	5 (6.4%)	73 (93.6%)	78	
Pre university and above	2 (4.3%)	45 (95.7%)	47	
Type of family				
Nuclear	9 (13%)	60 (87%)	69	0.004* (HS)
Joint	0 (0%)	61 (100%)	61	
Three generation	2 (14.3%)	12 (85.7%)	14	
Birth order				
Primigravida	0 (0%)	60 (100%)	60	0.009* (HS)
1	9 (15%)	51 (85%)	60	
≥2	2 (8.3%)	22 (91.7%)	24	
2. Knowledge about >8 danger signs of pregnancy				
Education of women				
Primary school and below	0 (0%)	19 (100%)	19	0.008 (HS)
Middle/ High school	15 (19.2%)	63 (80.7%)	78	
Pre university and above	11 (23.4%)	36 (76.6%)	47	
3. Awareness about financial assistance under JSY scheme				
Education of women				
Primary school and below	15 (78.9%)	4 (21.1%)	19	0.002 (HS)
Middle/ High school	61 (78.2%)	17 (21.8%)	78	
Pre university and above	23 (48.9%)	24 (51.1%)	47	
4. Identified mode of transportation.				
Education of women				
Primary school and below	7 (36.8%)	12 (63.2%)	19	0.008 (HS)
Middle/ High school	27 (34.6%)	51 (65.4%)	78	
Pre university and above	5 (10.6%)	42 (89.4%)	47	

5. Saved money for expenses.

Education of women				
Primary school and below	7 (36.8%)	12 (63.2%)	19	
Middle/ High school	43 (55.1%)	35 (44.9%)	78	0.004 (HS)
Pre university and above	12 (25.5%)	35 (74.5%)	47	
Husband's Education				
Primary school and below	28 (71.8%)	11(28.2%)	39	
Middle/ High school	26 (34.7%)	49 (65.3%)	75	0.000 (HS)
Pre university and above	8 (26.7%)	22 (73.3%)	30	
Birth Order				
Primigravida	19 (31.7%)	41 (68.3%)	60	
1	26 (43.3%)	34 (56.7%)	60	0.005 (HS)
≥2	17 (70.8%)	7 (29.2%)	24	
Type of previous delivery				
Normal	37 (67.3%)	18 (32.7%)	55	
Caesarean	7 (23.3%)	23 (76.7%)	39	0.000 (HS)

6. Identified blood donor

Education of women				
Primary school and below	17 (89.5%)	2 (10.5%)	19	
Middle/ High school	64 (82.1%)	14 (17.9%)	78	0.000 (HS)
Pre university and above	25 (53.2%)	22 (46.8%)	47	
Husband's Education				
Primary school and below	37 (94.9%)	2 (5.1%)	39	
Middle/ High school	53 (70.7%)	22 (29.3%)	75	0.000 (HS)
Pre university and above	16 (53.3%)	14 (46.7%)	30	
Current trimester				
2	44 (84.6%)	8 (15.4%)	52	0.03 (S)
3	62 (67.4%)	30 (32.6%)	92	

* Fischers exact test

S- Significant (p value <0.05)

HS- Highly Significant (p value <0.01)

signs in labour and 55 (38.1%) knew about danger signs during puerperium as shown in Table 4

The various sources of knowledge about danger signs were from doctors- 80 (55.5%), mother/mother-in-law – 30 (20.8%), healthcare workers- 9 (6.2%) and 2 (1.4%) from MCP card/ thai card

Complication readiness: Majority 101 (70.1%) knew about referral services, 110 (76.4%) identified birth companion during delivery and only about 38 (26.4%) identified a blood donor as depicted in figure 2

Association between socio demographic profile with BPACR components

Education of women upto middle/high school and above were found to be statistically significantly associated with various factors like > 4 ANC check up, knowledge about danger signs of pregnancy, saving money, identifying mode of transport, awareness about financial assistance in JSY, identifying referral hospitals and identifying blood donor.

Socioeconomic status like BPL and APL had statistically significant associations with early registration (0.001), consumption of IFA (0.001), identifying SBA (0.03).

Type of family was statistically significantly associated with > 4 ANC visits (0.004), identifying referral hospital (0.03). Husband's education was associated with identifying blood donor, SBA, referral hospital and saving money. Saving money was also associated with parity and type of previous delivery. However no statistically significant associations found between religion, care giver's education and BPACR components.

DISCUSSION

Maternal mortality continues to be alarming in India. There are several causes which lead to MMR, perinatal and neonatal mortality and these causes could be sudden and severe leading to unpredictable outcomes. There is need for planning the birth and emergency preparedness in order to be aware and reduce the delays in seeking healthcare services. BPACR is one such tool and has also been adopted by WHO antenatal care model and the integrated management of pregnancy and childbirth (IMPAC). This tool also involves interpersonal communication among the family members to engage themselves in the planning of the birth, making the pregnant women and the family members alert and prepared to face any complications thus promoting a skilled maternal and neonatal care during childbirth

The present study revealed BPACR index of 43.98%. Early registration of pregnancy in first trimester and identifying Skilled Birth Attendant to avail ANC services forms a vital step in ANC care. In the present study majority of them 88.2% had early registration which is more than Karnataka (82.2%) and 84.7% identified SBA.¹¹ This is similar to Acharya et al study where majority identified SBA for delivery.¹⁰

The awareness of antenatal services in present study group was good with majority of them 92.4% receiving more than 4 Antenatal visits, 98.6% aware of TT vaccination and 90.3% of them being aware about consumption of IFA tablets. The above findings were higher compared to a study in Indore by Agarwal et al.⁹

One of the key components of BPACR is assessing knowledge about danger signs of pregnancy. Early and immediate identification of obstetric complications is necessary to seek care and also for timely referral services. It is well observed in this study that awareness about danger signs of pregnancy is way too less, only 18.7% of them knew >8 danger signs of pregnancy. About 14.5% of them were completely unaware of danger signs. Although all registered women were given MCP card where there were pictorial representations of these warning signs, only 2 of them had obtained information about it via MCP card and the rest of them might have not been sensitized about it by healthcare workers. The counseling sessions might have also been inadequate in this context. These findings are similar to studies done by Acharya et al in New Delhi (27.8%) and Rajesh P et al in Tumkur (24.26%)^{10,12}

Lack of money and delay in arranging vehicle to commute can become a barrier to access healthcare. Hence saving money and identifying means of transport in prior is essential. In this study it was found that more than half 56.9% had started saving money for delivery expenses and 63.9% had identified transport to hospital. This aspect of saving money and arranging transport was found to be better amongst participants of higher educational status. It was interesting to find that those with previous caesarean type of delivery made arrangements for money and vehicle. In a study conducted by Agarwal et al in slums of Indore, 76.9% saved money and only 29.5% identified transport.⁹ In a similar study done in Kenya, 84.3% had saved money for labor; and in study done in Nigeria, 64.8% had saved money for delivery, and 62.3% had made arrangements for transport.^{13,14}

The Government of India introduced JSY scheme in the year 2005 with cash benefits for the pregnant women and also transport arrangements during the delivery. In spite of several years after roll out of the scheme, the awareness about JSY scheme has been low. In the present study only 31.3% of them knew about financial assistance and 28% knew about transportation arrangements provided under JSY scheme. These findings are in contrast with studies conducted by Rajesh et al where 60% knew about financial benefits and 36.39% knew about transportation arrangements under JSY¹²

In the present study, the components of complication readiness were assessed by factors like identifying blood donors (26.4%), identifying birth companion (76.4%) and identifying higher centre for referral services (70.1%). The latter two components were good but only a few

perceived identifying blood donors during obstetric emergency was necessary. The findings with respect to identifying blood donor are consistent with a study by Patil et al (29.75%), whereas it was low in a study done by Mukhopadhyay DK et al (9.6%) and Hailu M in Souther Ethiopia 2.3%.^{15,16,8}

The overall BPACR was found to be 43.98% in this study. The major contributors for low BPACR here are poor knowledge about danger signs of pregnancy and JSY scheme benefits. The corresponding figures reported in other studies were Agarwal et al in Indore (47.8%), Acharya A S et al in, Delhi (41%), Mukhopadhyay D K et al (34.5%), Rajesh et al in Tumkur (35.85%).^{9,10,16,12}

This study has shown that education of the women and their husbands, parity, type of family play a vital role in improving the BPACR status.

The limitations of the study were that firstly, it was facility based and awareness about ANC care and check up would be higher. Secondly, a small sample size was taken for the study. Hence the results can't be generalized to the population and thus opens vistas for further research.

CONCLUSION

The BPACR of this study was found to be 43.98% which means less than half of the pregnant women were well prepared for the delivery. Majority of the women received antenatal services in first trimester; the Antenatal services received were found to be good. A majority had arranged for transportation during the delivery. More than half of them saved money for the expenses that could incur such as for hospitalization, post delivery. However awareness about danger signs of pregnancy and benefits of JSY scheme were poor which lowered the BPACR score. Although the components of BPACR are portrayed in MCP card women were not sensitized about the same. The ANC clinics in urban area should emphasize on Behavior Change Communication activities in pregnant women and the family members about the birth plan, complication readiness and benefits of JSY scheme. The healthcare workers and doctors should be pro active in educating about comprehensive maternal care. This will be an affirmative approach towards safe motherhood.

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REFERENCES:

1. Trends in Maternal Mortality: 1990 to 2015 [Internet]. 2016 [cited 3 August 2017]. Available from:<http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/>
2. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller A, Daniels J et al. Global causes of maternal death: a WHO systematic analysis. *The Lancet Global Health*. 2014;2(6):e323-333.
3. Home | (National Institution for Transforming India), Government of India [Internet]. Niti.gov.in. 2017 [cited 18 August 2017]. Available from: <http://niti.gov.in>
4. Standards for maternal and neonatal care [Internet]. www.who.int/making_pregnancy_safer/publications/en. 2007 [cited 18 August 2017]. Available from: <http://apps.who.int/iris/bitstream/10665/69735/1/a91272.pdf>
5. Thaddeus S, Maine D. Too far to walk: Maternal mortality in context. *Social Science & Medicine*.1994;38(8):1091-1110.
6. SDG 3: Ensure healthy lives and promote wellbeing for all at all ages [Internet]. World Health Organization. 2017 [cited 18 August 2017]. Available from: <http://www.who.int/sdg/targets/en/>
7. Monitoring birth preparedness and complication readiness tools and indicators for maternal and newborn health [Internet] , Maryland: JHPIEGO; 2004 [cited 18 August 2017]. Available from: https://pdf.usaid.gov/pdf_docs/pnada619.pdf
8. Hailu M, Gebremariam A, Alemseged F, Deribe K. Birth Preparedness and Complication Readiness among Pregnant Women in Southern Ethiopia. *PLoS ONE*. 2011;6(6):e21432.
9. Agarwal S, Sethi V. Birth Preparedness and Complication Readiness among Slum Women in Indore City, India. *J Health Popul Nutr*.2010;28(4):383-391.
10. Acharya A, Kaur R. Making Pregnancy SaferBirth Preparedness and Complication Readiness Study Among Antenatal Women Attendees of A Primary Health Center, Delhi. *IJCM*. 2015;40(2):127-34.
11. District Level Household and Facility Survey -4 (2012-13) [Internet]. Mumbai: International Institute for Population Sciences; 2013 [cited 18 August 2017]. Available from: <http://www.rchiips.org/>
12. P. R, R. S, S. R, Iyengar K. A study to assess the birth preparedness and complication readiness among antenatal women attending district hospital in Tumkur, Karnataka, India. *International Journal of Community Medicine and Public Health*. 2016;919-924.
13. Moran AC, Sangli G, Dineen R, Rawlins B, Yaméogo M, Baya B. Birth-preparedness for maternal health: findings from Koupéla district, Burkina Faso. *Journal of health, population, and nutrition*.2006 Dec;24(4):489.
14. Mutiso SM, Qureshi Z, Kinuthia J. Birth preparedness among antenatal clients. *East African Medical Journal*.2008;85(6):275-83.
15. Patil M, Vedpathak V, Aswar N, Deo D, Dahire P. Birth preparedness and complication readiness among primigravida women attending tertiary care hospital in a rural area. *International Journal of Community Medicine and Public Health*. 2016;2297-2304.
16. Mukhopadhyay DK, Mukhopadhyay S, Bhattacharjee S, Nayak S, Biswas AK, Biswas AB. Status of birth preparedness and complication readiness in Uttar Dinajpur District, West Bengal. *Indian Journal of public health*. 2013 Jul 1;57(3):147.

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A Study on Activities of Daily Living Among Elderly in a Rural Population of Tamilnadu

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Abstract

BACKGROUND: India is the land of most rapidly ageing population (aged 60 years and above) in the developing world. This phenomenon is marked by a series of social, cultural and economic implications due to a greater prevalence of morbidity and functional disability in this age group. The objective of the study is to assess Activities of Daily Living among elderly in a rural population. **METHODOLOGY:** The study was a population based cross sectional study conducted among 450 elderly subjects from 60 years and above residing in Poonamallee block of Thiruvallur district in Tamil Nadu. Data regarding activities of daily living was assessed using Katz scale. Informed consent was obtained from all the participants. The ethical clearance was obtained from institutional ethics committee. **RESULTS:** Majority of the study subjects were elderly females 274 (60.9%). Large proportion of elders 222 (49.3%) were in the age group 60-65 years. Large proportion of elders 269 (59.7%) were illiterate. Majority of the elderly 356 (79.1%) were unemployed. The prevalence of dependence for all activities of daily living was almost similar for males (5.7%) and females (5.5%). Difference in prevalence was found to be statistically not significant ($p=0.92$) **CONCLUSION:** There should be a proper support from all sections towards the elderly. The community must be encouraged to let elderly participate in different activities, which will reduce dependence on others.

Key-words: Ageing ,daily activities, dependence, KATZ scale

INTRODUCTION

India is the land of most rapidly ageing population (aged 60 years and above) in the developing world. This phenomenon is marked by a series of social, cultural and economic implications due to a greater prevalence of morbidity and functional disability in this age group. Functional status is an individual's ability to live independently and to relate to their environment or to perform normal activities required to meet basic needs, fulfil usual roles and maintain health and wellbeing. Functional status has been used to describe motor functions, ability to perform ADL (activities of daily living) ability to perform IADL (Instrumental Activities Of Daily Living) as reported by national academy on ageing society¹. Functional status can be influenced by biological or physiological impairment and socio economic factors, symptoms, mood and other factors. Several studies have revealed the association between

ageing and higher risk of functional dependence and higher prevalence of functional disability in the older population based on three reports done by Chan, Jagger, and Knight et al²⁻⁴. The decline in the functional status may be associated with number of multi-dimensional factors that interact to determine this status in older adults. Timely detection of these factors may help to prevent functional dependence in this population. For progressive chronic diseases like the heart failure and chronic obstructive pulmonary diseases, it is particularly important to understand the functional ability as functional status losses are inevitable, slowing the decline, is the goal for most patients with these diseases and health care workers caring for them³⁻⁴.

MATERIALS AND METHODS

Activities of Daily Living was assessed by using Katzscale for activities of daily living which is referred to as Katz ADL, is the most appropriate instrument to assess

functional status as measurement of client ability to perform activities of daily living independently. Clinicians typically use the tools to detect problems in performing activities of daily living and to plan care accordingly. The questionnaire was translated in the local Tamil language by the investigator.

The study was done as a population based cross sectional study at Poonamallee block of Thiruvallur district which includes 160 villages. The study population included all the elderly from 60 years and above residing Poonamallee Block. Cluster sampling method was used for selecting the elderly as study subjects. Based on assumption of 25% as prevalence of depression and alpha error 6% and limit of accuracy of 25% of prevalence and a design effect of 2, the minimum sample size required for the study was 400. Though the minimum sample size calculated was 400 it was decided to have a little larger sample size of 450 for better precision. Approximately 10 participants were interviewed per day for 45 days between the periods of January- June 2013.

The ethics committee approval was obtained. First it was enquired if there is an elderly person 60 years or above in the family. If there is no such elderly person in the family the investigator passed on to the next adjoining family. If an elderly person 60 years or above was present, a brief introduction was given to the elderly person regarding the purpose of the study after obtaining the informed consent orally. Relevant information about the elderly was obtained using validated questionnaires. If there were more than one elderly in the family one of them was chosen randomly. Information for the study was obtained by the investigator from the selected study subjects as per the Katz scale for activities of daily living. It took nearly 45 minutes to complete the interview per selected study subject. It took about 4 months to complete the data collection from all the study subjects.

RESULTS

A total of 400 elderly participants were included in this study of which majority of the population 49.3% were in the age group of 60-65 years and 60.9% were females. Among the study population 82.7% were Hindus. Majority of elders 59.7% were illiterate and 79.1% were unemployed and 27.4% belongs to class III socio economic status according to modified prasad's classification. Majority of elders 54.6% were living in the family with 1-3 family members. 38.2% elderly population were living with their children's [Table I]. It is seen that the prevalence of dependence for all activities of daily living increases and the difference in the prevalence in the age groups 60-65 found was found to be statistically significant ($p=0.02$). Details given in table II. The prevalence of dependence was found to be higher in toileting and continence details are given in Table III. The prevalence of dependence for major activities of daily living is found to be 4.5% in males when compared to females shown in table IV. The

prevalence of dependence for individual various activities of daily living among elders in the age group 60-65 years was 1.8% with a confidence interval ranging from 0.1 to 3.6. The difference in prevalence is found to be statistically significant ($P=0.01$) which is shown in Table V.

TABLE I: Socio Demographic characteristics of study population

Socio demographic characters	N (%)	Socio demographic characters	N (%)
Age group		Occupation	
60-65 years	222(49.3)	Clerical/shop/farm	26(5.8)
66-70 years	99 (22.0)	Skilled	10(2.2)
>70 years	129 (28.7)	Unskilled	58(12.9)
Gender		Unemployed	356(79.1)
Male	176(39.1)	Social class	
Female	274(60.9)	Class I	46(10.2)
Religion		Class II	59(13.1)
Hindu	372(82.7)	Class III	123(27.4)
Muslim	15(3.3)	Class IV	117(26.0)
Christian	63(14.0)	Class V	105(23.3)
Education		Living arrangements	
Graduate	3(0.7)	Living alone	77(17.1)
High school	82(18.2)	Living with spouse	63(14.0)
Middle school	16(3.6)	Living with children	172(38.2)
Primary school	80(17.2)	Living with spouse and children	138(30.7)
Illiterate	269(59.7)		
Family members			
1-3	246(54.6)		
4-5	116(25.8)		
>5	88(19.6)		

Table II Prevalence of dependence for all activities of daily living by sex and age group in years

	Total (n)	Dependent (n)	Prevalence of dependence (%)	95% CI	P value
Sex					
Male	176	10	5.7	2.3-9.13	0.92
Female	274	15	5.5	2.8-1.2	
Age group					
60-65	222	6	2.7	0.6-4.8	0.02
66-70	99	7	7.1	2.0-12.2	
>70	129	12	9.3	4.2-14.3	

Table III: Prevalence of dependence for each of the activities of daily living

Activities	Total	Dependent (n)	Prevalence of dependence (%)	95%CI
Bathing	45	20	4.4	2.5-6.3
Dressing	45	20	4.4	2.5-6.3
Toileting	45	22	4.9	2.9-6.9
Transferring	45	21	4.7	2.7-6.7
Continenence	45	22	4.9	2.9-6.9
Feeding	45	19	4.2	2.3-6.01

Table IV Prevalence of dependence for individual activities for of daily living by sex

	Total	Dependent (n)	Prevalence of dependence (%)	95%CI	p value
Bathing					
Male	176	8	4.5	1.4-7.6	0.93
Female	274	12	4.4	2.0-6.8	
Dressing					
Male	176	8	4.5	1.4-7.6	0.93
Female	274	12	4.4	2.0-6.8	
Toileting					
Male	176	9	5.1	1.9-8.4	0.85
Female	274	13	4.7	2.2-7.2	
Transferring					
Male	176	9	5.1	1.9-8.4	0.71
Female	274	12	4.4	2.0-6.8	
Continenence					
Male	176	9	5.1	1.9-8.4	0.85
Female	274	13	4.7	2.2-7.2	
Feeding					
Male	176	8	4.5	1.4-7.6	0.78
Female	274	11	4	1.6-6.3	

DISCUSSION:

The level of dependence based on the activities of daily living such as bathing, dressing, toileting, transferring, continence and feeding was measured using Katz scale. The number of elderly subjects who were found to be dependent for all activities of daily living namely bathing, dressing, toileting, transferring, continence, feeding was 25 and the prevalence of dependence for all the above activities of daily living was 5.5%. Though the prevalence of 5.5% does not appear to be very high, since the

dependence is for all the 6 activities of daily living it can be considered as a serious problem.

In a study done in Simla the prevalence of dependence was found to be 5.5% which is a similar finding to the

Table V: Prevalence of dependence for individual various activities of daily living by age group in years

	Total N	Dependence N	Prevalence of Dependence%	95%CI	p value
Bathing					
60-65	222	4	1.8	0.1-3.6	0.01
66-70	99	5	5.1	0.8-9.4	
>70	129	11	8.5	3.7-13.3	
Dressing					
60-65	222	4	1.8	0.1-3.6	0.01
66-70	99	5	5.1	0.8-9.4	
>70	129	11	8.5	3.7-13.3	
Toileting					
60-65	222	4	1.8	0.1-3.6	0.005
66-70	99	6	6.1	1.4-10.8	
>70	129	12	9.3	3.7-13.3	
Transferring					
60-65	222	4	1.8	0.1-3.6	0.01
66-70	99	6	6.1	1.4-10.8	
>70	129	11	8.5	3.7-13.3	
Continenence					
60-65	222	5	2.3	0.5-4.1	0.03
66-70	99	7	7.1	2.0-12.2	
>70	129	10	7.8	3.2-12.4	
Feeding					
60-65	222	4	1.8	0.1-3.6	0.02
66-70	99	5	5.1	0.8-9.4	
>70	129	10	7.8	3.2-12.4	

present study⁵. In a study done in Manipur the prevalence of dependence was found to be 12.2% which is higher than the present study⁶. The prevalence of dependence for all activities of daily living was found to be 10% using a 5 item Katz Scale in a study carried out in Egypt⁷. The prevalence of dependence for all activities of daily living was 3.8% in a study done in Vietnam during 2007⁹.

The prevalence of dependence for all activities of daily living was almost similar for males and females (5.7% and 5.5%) respectively in the present study.

In a study done in Shimla to assess the prevalence of limitations in Activities Of Daily Living (ADL) and Instrumental ADL (IADL) among elderly, IADL limitations were more among female elderly (26%) as compared to males (17%). In a study done in Manipur it was observed that males (14.8%) were more disabled than females (10.2%)⁶.

The prevalence of dependence for all activities of daily living in the age groups 60-65, 66-70, and above 70 years was found to be 2.7%, 7.1% and 9.3% respectively. It is

seen that as age increases, the prevalence of dependence for all activities of daily living increases and the difference in the prevalence in the three age groups is found to be statistically significant ($p=0.02$). The prevalence of disability in the age groups 60-69, 70-79, >80 years was found to be 65.2%, 23.7%, 11.1% in a study done in Egypt⁷.

The elderly subjects in the age groups 60-69, 70-79, >80 were found to have IADL functional impairment as 2.5%, 44.1%, 73.6% in a study done in Simla⁵. The prevalence of disability among the elderly in the age group 60-69, 70-79, >80 were found to be 2.8%, 15.6%, 45.2% in a study done at Manipur⁶. The prevalence of disability among the elderly in the age group 60-69 years, 70-79 years, 80 years or older were found to be 18.0%, 33.8%, 48.3% in a study done at Brazil¹⁰.

In present study the prevalence of dependence for each activities of daily living namely bathing, dressing, toileting, transferring, continence and feeding was found to be 4.4%, 4.4%, 4.9%, 4.7%, 4.9% and 4.2% respectively.

In a study done in Egypt to measure functional independence in elderly as the ability to do Activities Of Daily Living without the assistance of another person, it was measured using Katz scale with 5 items (bathing, dressing, transferring, toileting, eating) the prevalence of dependence was observed as 7.7% for bathing, 6.9% for dressing, 7.7% for toileting, 4.2% for eating⁷.

There was a difference in the study done in Lucknow which reported majority of males and females in both rural and urban areas had a self-ability of dressing, toileting, transferring, self-control over urination & defecation & self feeding⁸.

Bathing was the most difficult task for the older person to perform in a study done in Simla⁵. In the present study the prevalence of dependence for bathing among elderly males was 4.5% and for females is 4.4%. In a study done in Lucknow it was found that 92.5% both males and females had the ability to bathe independently⁸. In the present study done in Simla revealed that bathing was found to be the most difficult task for the older persons to perform. Dressing, toileting, transferring, eating were found to be less frequent in dependency a possible reason for this may be the cold weather conditions prevailing in the study area the act of bathing starts right from arranging hot water in a bucket to and carrying it to a appropriate place in the bathroom. Further the process of pouring water over the body might be restricted in the elderly owing to stiffness and paining joints. Thus this multiple task process might invite help from care givers. The dependency in other activities like dressings was less frequent because for elderly it might be embarrassing to be dressed in the presence of other people, so they do not take help in this activity. Similar might be the explanation for toileting and eating wherein elderly do not seek help until they feel they can no longer carry on the activity⁸.

In the present study the prevalence of dependence for dressing among elderly males was 4.5% and for females was 4.4%. In a study done in Lucknow to find ability among elderly 83.1% of males and 90.0% of females had self ability for dressing. The prevalence of dependence for toileting among elderly males was 5.1% and for females is 4.7%. 90.6% of males and 98.4% of females had the ability of toileting in a study done in Lucknow. The prevalence of dependence for transferring among elderly males was 5.1% and for females is 4.4%. About 89.2% of males and 95.2% of females had the ability for transferring in a study done in Lucknow⁸. In the present study the prevalence of dependence for continence among elderly males was 5.1% and for females 4.7%. In all about 83.1% of elderly males and 92% of elderly females had the ability to self control over urination and defecation. Rural elderly had better control over urination and defecation. In the present study, the prevalence of dependence for feeding among elderly males was 4.5% and for females 4.0%. In all 97.2% of elderly males and 99.5% of elderly females had the ability of self-feeding in a study done in Lucknow⁸.

In the present study, the prevalence of dependence for bathing among elders in the age group 60-65 years was 1.8%, in the age group 66-70 years was 5.1%, and in the age group more than 70 years was 8.5%. In a study done in California revealed the prevalence of dependence for bathing in the following age groups 55-64, 65-74, 75-84, 85+ as 8.1%, 8.3%, 12.0%, 20.8% which is comparatively higher than present study.

In the present study the prevalence of dependence for dressing among elders in the age group 60-65 years was 1.8%, in the age group 66-70 years was 5.1%, and in the age group more than 70 years was 8.5%. In a study done in California revealed the prevalence of dependence for dressing in the following age groups 55-64, 65-74, 75-84, 85+ as 8.1%, 8.3%, 12.0%, 20.8%.

In the present study the prevalence of dependence for toileting among elders in the age group 60-65 was 1.8%, in the age group 66-70 years was 6.1%, and in the age group more than 70 years was 9.3%. In a study done in California revealed the prevalence of dependence for toileting in the following age groups 55-64, 65-74, 75-84, 85+ as 3.7%, 4.1%, 7.1%, 11.6%.

In the present study, the prevalence of dependence for transferring among elders in the age group 60-65 years was 1.8%, in the age group 66-70 years was 6.1%, and in the age group more than 70 years was 8.5%. In a study done in California revealed the prevalence of dependence for transferring in the following age groups as 55-64, 65-74, 75-84, 85+ as 6.1%, 6.6%, 9.2%, 15.7%.

In the present study the prevalence of dependence for feeding among elders in the age group 60-65 years was 1.8%, in the age group 66-70 years was 5.1%, in the age group 70 years and above was 7.8%. In a study done in California revealed the prevalence of dependence for feeding in the following age groups as 55-64, 65-74, 75-84, 85+ was 2.4%, 2.9%, 5.4%, 8.2%¹¹.

CONCLUSION: The overall prevalence of dependence was found to be more among elderly males and the dependence was more among the elderly in the age group more than 70 years. There should be a proper support from all sections towards the elderly. The community must be encouraged to let elderly participate in different activities which will reduce the dependence on others.

RECOMMENDATIONS: Early detection and treatment for depression can improve elderly peoples Quality Of Life and reduce dependence on others. Therefore, the primary care givers need to be vigilant in identifying depression early in the elderly and to facilitate effective treatment.

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REFERENCES

1. Washington: National Academy on an Aging Society; Depression: A treatable disease. <http://www.agingsociety.org/agingsociety/pdf/depression.pdf>. (Accessed 11/10/2013).
2. Chan, K.M., Pang, W.S., Ee, C.H., Ding, Y.Y., Choo P. . Functional Status of the Elderly in Singapore. Singapore Medical Journal (1999); 40(10): 635-638.
3. C. JAGGER N. A. SPIERS M. CLARKE. Factors Associated with Decline in Function, Institutionalization and Mortality of Elderly People. Age and Ageing 1 May 1993; Volume 22(Issue 3): 190-197.
4. Margaret M. Knight PHD RN CS. Cognitive ability and functional status. Cognitive ability and functional status June 2000; 31(06): 1459-1468.
5. Deepak Sharma, Anupam Parashar, Salig Ram Mazta. Functional status and its predictor among elderly population in a hilly state of North India. International Journal of Health & Alliance Sciences 2014; 3(3): 159-163.
6. Dr Shantibala Konjengbam, Dr Naorem Bimol, Dr AK. Joy Singh, Dr AK. Brogen Singh, Dr E Vijaya Devi, Dr Y Manihar Singh. Disability in ADL among the Elderly in an

Urban Area of Manipur. Indian Journal of Physical Medicine and Rehabilitation 2007; 18(02): 41-43.

7. Eman M. Mahfouz, Hala AwadAllah. Determinants of Disability among Elderly Population in Rural Minia, Egypt. Central European Journal of Occupational and Environmental Medicine 2007; 13(1): 55-59.
8. Mrinal Ranjan Srivastava, Prathiba Gupta, Beena Sachan, Pankaj Bharatwajm Srivastava, Saritha Choudhary. . A Study of Depression among Aged in Urban and Rural Areas of Lucknow City. International Journal of Scientific Research 2013; 2(10): 1-4.
9. Le V Hoi, Pham Thang, Lars Lindholm. Elderly care in daily living in rural Vietnam: Need and its socioeconomic determinants. <https://bmcgeriatr.biomedcentral.com/articles/10.1186/1471-2318-11-81> (accessed 28.10.2013).
10. Inês Echenique Mattos, Cleber Nascimento do Carmo, Lívia Maria Santiago Email author and Laércio Lima Luz. Factors associated with functional incapacity in elders living in long stay institutions in Brazil: a cross-sectional study. <https://bmcgeriatr.biomedcentral.com/articles/10.1186/1471-2318-14-47> (accessed 28.10.2013).
11. Mitchell P. LaPlante. The Classic Measure of Disability in Activities of Daily Living Is Biased by Age but an Expanded IADL/ADL Measure Is Not. <https://academic.oup.com/biomedgerontology> (accessed 28.10.2013).

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Assessment of depression, anxiety and stress and it's association with suicide and substance abuse among adolescents in Bangalore - A cross section study**Vani Chalageri H¹, Shobha Bhat¹, Ranganath Sobagaiah T², Navya Sreenivas Sri³**

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Date of Submission : 06-10-2017**Date of online Publication** : 27-11-2017**Date of Acceptance** : 20-11-2017**Date of Print Publication** : 31-12-2017**Address for correspondence** : Dr. Ranganath Sobagaiah T. MD., Professor & HOD in Community Medicine, Bangalore Medical College and Research Institute (BMCRI), Fort K.R Road, Bangalore- 560002. E-mail: chinav.vani@gmail.com**Abstract**

INTRODUCTION: Adolescent accounts to one fifth of India's population. Investment in adolescent health will help India to reap the benefits of demographic dividend. Few of them are exposed to various health issues, out of which mental health is gaining importance. So the current study was designed to assess the burden of depression, anxiety and stress of Pre – University college students of Bangalore and its association with suicide and substance abuse. **METHODOLOGY:** Cross sectional study conducted among 389 students of selected colleges of Bangalore through convenient sampling technique. Pre tested semi structured questionnaire was administered and analysed in SPSS 17. Depression, anxiety and stress among students were assessed through DASS score-21 scale. Fischer exact test and chi square test were applied to find the association. **RESULTS:** Mean age (\pm SD) of the students was 16.7 yrs(0.66) and 197 (50.6%) were males. Among 389 students 136 (35%) belonged to government college; 177 (45.5%) to private and rest to aided college. While 205 (52.7%) were in commerce branch, 133 (34.2%) were in science branch and rest belonged to arts branch. Prevalence of depression, anxiety and stress in past one week were 38.82%, 50.12% & 19.79% respectively. Anxiety was more common among females ($p=0.001$); private college students ($\chi^2 = 18.51, p<0.01$) and among science branch ($\chi^2 = 17.88, p<0.01$). Stress was common among males ($p<0.043$) and among government college students ($\chi^2 = 12.33, p<0.002$). Depression, anxiety and stress were significantly associated with suicide consideration; attempted to suicide and positive family history of attempting & dying of suicide. Significant association was found between stress and smokeless tobacco consumption ($p=0.029$) & drug abuse ($p=0.003$). **CONCLUSION:** Burden of depression, anxiety and stress was high among students and its association with suicide was significant. Stress was significantly associated with smokeless tobacco consumption & drug abuse.

Key-words: Adolescent, depression, anxiety, stress, suicide, substance abuse.**INTRODUCTION**

India is currently facing a change in the health pattern due to epidemiological transition and presently witnessing the dual burden of communicable and non-communicable diseases (NCD). Among the NCDs mental, neurological and substance use disorders (MNSUDs) have accounted to major public health problems due to their greater share in morbidity and disability. As such these disorders can affect any age group and also include adolescent age group.¹

Adolescence is the transition period in everyone's life from 'child' to an 'adult'. The period between 10 to 19 years accounts to adolescence.²

Globally every 1 in 6 of the world's population is adolescent.³ In India, adolescents account to 21.2% of the country's population i.e one fifth of India's population.⁴ It is a period of opportunity to grow in confidence, autonomy, self esteem and intimacy, but it also carries greater risks. One such risk adolescents are taking is drug abuse.⁵

Majority are healthy but still a few are exposed to various health issues like early pregnancy and childbirth, HIV, infectious disease, depression, violence, alcohol and drugs, injuries, malnutrition etc.³ Among the various mental health problems depression is the third leading cause of disability and morbidity while suicide is the third leading cause of mortality among the

adolescents. Adolescents harmful drinking can result in risky behaviours, reduced self control, road traffic accidents, violence and pre mature death. Tobacco consumption is slowly rising among the adolescent though cigarette smoking seems to be decreasing. Drug abuse among this age group has become a global concern.³

Even in India the burden of substance abuse and mental health disorders in this age group are increasing. According to NFHS 3 alcohol consumption in adolescent males and females were 11% and 1%. Tobacco consumption (smoke and smokeless) in adolescent males and females were 29% and 4%. Based on the study conducted by Youth in India in 2006-07, almost 14% of adolescents reported symptoms or behaviours indicative of mental health disorders.⁴ Out of 1,33,623 suicides in India in 2015 among less than 18 years was 9408 which accounted to 7.04%. Main cause for suicide among children less than 14 years was 'failure in examination'.⁶ According to National Mental Health Survey (2015-16) report prevalence of depression among 13-17 yr old children was 0.8%(CI 0.3-1.4). Depression if neglected at this age can result in protracted health and mental health problems in later life.⁷

Mental health and prevention of substance abuse have been emphasized in Sustainable Developmental Goals led by United Nations which are to be achieved by 2030. Goal 3, target 4 emphasizes on reduction of premature mortality from non-communicable diseases by one third through prevention, treatment and promotion of mental health and well-being. While Goal 3 – Target 5 emphasizes on strengthening the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.⁸

Today's adolescents are the future work force of our nation. To successfully harness India's demographic dividend we need to ensure that these adolescents are healthy both physically and mentally. Investment in adolescent health will have a positive impact on India's health goals as well as on the social and economic impact of our country.⁴ For this to happen first we need to assess the mental health status or burden of mental health problems in our Indian adolescents. So the current study was designed with an objective to assess the burden of depression, anxiety and stress of Pre – University college students of Bangalore. Additionally an attempt was made to see if there was any association of depression, anxiety and stress with suicide and substance abuse.

METHODOLOGY

The original study conducted focussed on perceptions about vocational education among students studying in selected Pre University colleges in Bangalore and also assessed the presence of risk factors for non communicable diseases among these students.⁹ Only a part of the data on depression, anxiety and stress, suicide and substance abuse has been discussed here. This cross

sectional study was conducted in the month of July-August 2015 using convenience sampling technique. Study population included all the students studying first and second pre university (PU) degree in selected colleges of Bangalore. Students from government, private and aided colleges and also from arts, science and commerce combination participated. Inclusion criteria consisted of all the students pursuing 1st & 2nd year PU degree in selected colleges and those who were present on that particular day in the college at the time of interview. Those who were not willing to participate for their own reasons were excluded. Based on these totally 389 students participated.

Questionnaire was developed & pilot tested. Pre tested semi structured questionnaire was administered to first and second year students of selected colleges in Bangalore. Depression, anxiety and stress among students were assessed through DASS score-21 scale.¹⁰ Suicide information was collected with the help of WHO STEP-wise approach Mental Health Suicide module

Statistics: SPSS version 17.0 was used for analysis. Quantitative variables were expressed in frequency and percentages. Fischer exact test and chi square test were employed for evaluating statistical significance.

Ethical clearance was obtained for conducting the study from the institutional ethical committee. During the survey, consent from the head of the institutions of the selected colleges and informed assent was taken from all the students who provided information.

RESULTS

Demographic details of students

Information was collected from 389 students. Mean age of the study population was 16.7 years (0.66) and 197 (50.6%) were males. Among them 180 (50.6%) were first PU students, 177 (45.5%) belonged to private college and 205 (52.7%) to commerce branch. (Table 1)

Depression, anxiety and stress

Prevalence of depression, anxiety and stress in past one week was 38.82%, 50.12% and 19.79% respectively. Mild to moderate depression was present in 65 (16.7%) and 59 (15.2%). Moderate level of anxiety was present in 99 (25.4%). While 36 (9.3%) were suffering from mild stress (Table 2). Anxiety was more common among females ($p=0.001$); private college students ($\chi^2 = 18.51, p<0.01$) and among science branch ($\chi^2 = 17.88, p<0.01$). Stress was common among males ($p<0.043$) and among government college students ($\chi^2 = 12.33, p<0.002$) (Table 1)

Association with Suicide

In our study 15 (3.9%) of them had attempted to suicide in past 12 months while 25 (6.4%) of close family members like mother/father/sibling/relative had ever attempted to suicide out of which 22(5.6%) died after committing suicide. All three i.e depression, anxiety and stress were significantly associated with consideration of suicide, attempted suicide among students. Similar results

Table 1: Demographic details of study population and its association with depression, anxiety and stress

Age (years)	n (%)	Depression present	Anxiety present	Stress present
16-17	354 (91.1)	141	182	67
18-20	35 (8.9)	10	13	10
		*P value=0.2	*P value =0.11	*P value =0.18
Gender				
Male	197 (50.6)	70	82	47
Female	192 (49.4)	81	113	30
		*P value =0.21	*P value =0.001	*P value =0.043
Type of the college				
Government	136 (35)	55	64	40
Aided	76 (19.5)	22	24	10
Private	177 (45.5)	74	107	27
		Chi square = 3.93	Chi square = 18.51	Chi square = 12.33
		P value = 0.14	P value <0.01	P value = 0.002
Pre University College				
First PUC	180 (46.3)	63	84	35
Second PUC	209 (53.7)	88	111	42
		*P value =0.17	*P value =0.22	*P value =0.89
Branch				
Arts	51 (13.1)	21	27	10
Science	133 (34.2)	56	85	24
Commerce	205 (52.7)	74	83	43
		Chi square = 1.36	Chi square = 17.88	Chi square = 0.43
		P value = 0.5	P value <0.01	P value = 0.8
Total	389 (100)	151	195	77

*Fischer exact test

Table 2: Level of depression, anxiety and stress among students using WHO DASS score 21 scale

Variables	DEPRESSION n (%)	ANXIETY n (%)	STRESS n (%)
NORMAL	238 (61.2)	194 (49.9)	312 (80.2)
MILD	65 (16.7)	50 (12.9)	36 (9.3)
MODERATE	59 (15.2)	99 (25.4)	23 (5.9)
SEVERE	21(5.4)	28 (7.2)	15 (3.9)
EXTREMELY SEVERE	6 (1.5)	18 (4.6)	3 (0.8)
Total	389 (100.0)	389 (100.0)	389 (100.0)

Table 3: Association of depression, anxiety and stress with suicide among the students

Mental Health Problems	Seriously considered attempting to suicide in past 12 months (n)			Total	Fisher's Exact Test (P value)
		yes	no		
Depression	Absent	7	231	238	(p<0.01)
	Present	21	130	151	
Anxiety	Absent	7	187	194	(p=0.01)
	Present	21	174	195	
Stress	Absent	17	295	312	(p=0.012)
	Present	11	66	77	
	Total	28	361	389	
Attempted to suicide in past 12 months*					
Depression	Absent	0	238	238	(p<0.01)
	Present	15	136	151	
Anxiety	Absent	0	194	194	(p<0.01)
	Present	15	180	195	
Stress	Absent	8	304	312	(p=0.015)
	Present	7	70	77	
	Total	15	374	389	
Close family member ever attempted suicide**					
Depression	Absent	10	228	238	(p=0.033)
	Present	15	136	151	
Anxiety	Absent	6	188	194	(p=0.012)
	Present	19	176	195	
Stress	Absent	13	299	312	(p=0.01)
	Present	12	65	77	
	Total	25	364	389	
Close family member ever died from suicide**					
Depression	Absent	6	232	238	(p<0.01)
	Present	16	135	151	
Anxiety	Absent	3	191	194	(p=0.01)
	Present	19	176	195	
Stress	Absent	9	303	312	(p<0.01)
	Present	13	64	77	
	Total	22	367	389	

*1 student refused to answer has been included under no column while analysing.

**5 students refused to answer have been included under no column while analysing

were also observed with close family members attempting and dying due to suicide (Table 3).

Association with substance abuse

In our study 12 (3.1%) of the students were current tobacco smokers while 121 (31.1%) were current smokeless tobacco user (Ex: pan masala, gutka). Alcohol consumption in past one year was present in 12 (3.1%). Multiple substance abuse was present in 24 (6.2%) which included fluid inhalers 2 (0.5%), steroid pills or shots 9 (2.3%), cough syrup without doctor's prescription 12 (3.1%) and drug injectable 3(0.8%). Depression and anxiety were not associated with any kind of substance abuse like tobacco consumption (both smoke and smokeless form), alcohol consumption and multiple

substance abuse. But stress was significantly associated with chewing tobacco ($p=0.029$) and with multiple substance abuse ($p=0.003$) (Table 4)

Table 4: Association of depression, anxiety and stress with substance abuse among the adolescent students

Mental health problems	Current tobacco user (smoker)		Total	Fisher's Exact Test (P value)
	yes	no		
Depression	Absent	8	230	238 (p=0.77)
	Present	4	147	
Anxiety	Absent	5	189	194 (p=0.771)
	Present	7	188	
Stress	Absent	8	304	312 (p=0.265)
	Present	4	73	
	Total	12	377	
Current tobacco user (smokeless)				
Depression	Absent	79	159	238 (p=0.312)
	Present	42	109	
Anxiety	Absent	65	129	194 (p=0.326)
	Present	56	139	
Stress	Absent	105	207	312 (p=0.029)
	Present	16	61	
	Total	121	268	
Alcohol in past 12 months				
Depression	Absent	7	231	238 (p=1.0)
	Present	5	146	
Anxiety	Absent	6	188	194 (p=1.0)
	Present	6	189	
Stress	Absent	8	304	312 (p=0.265)
	Present	4	73	
	Total	12	377	
Multiple substance abuse				
Depression	Absent	11	227	238 (p=0.131)
	Present	13	138	
Anxiety	Absent	7	187	194 (p=0.056)
	Present	17	178	
Stress	Absent	13	299	312 (p=0.003)
	Present	11	66	
	Total	24	365	

DISCUSSION

In our study we found that anxiety was more common among females which correlates with the common finding that anxiety is more prevalent and more disabling among females when compared to males. Probably due to academic pressure in private college students and among the science branch anxiety was commonly seen among these students. Among those students who attempted to or had serious thoughts of committing suicide and also among similar family history of attempting or committing suicide all three i.e depression, anxiety and stress were significantly high in

our studies. This indicates that suicide is strongly associated with depression, anxiety and stress. So any student under depression or anxiety or stress should not be neglected and also need to be evaluated for suicidal ideations and appropriate counselling needs to be provided whenever necessary.

In the present study while collecting the details of suicide an option of 'refused to answer' was given for which five students had opted for it. So certain amount of response bias could have occurred. This was overcome by considering them in the 'No' column while analysing. Academic pressure like tests or internals or exams may cause stress or anxiety and their exam low results may lead to depression in few of the students which can alter the results. In order to minimise this bias the study was conducted during such period where there were no tests or exams or the announcement of results in next or past one week respectively.

Depression, anxiety and stress were assessed in 242 adolescents in 2007 among the school students of 9th-12th std at Uttar Pradesh. Mean age was 15(1.1) years and 57% were males. They found that all three were significantly correlated and depression was more among females ($p=0.03$).¹¹ While in our study mean age was 16.7 yrs(0.66) and 197 (50.6%) were males. Even in our study all three were significantly correlated with each other. Anxiety was more among females ($p<0.01$), while stress was common among males ($p=0.043$).

Depression (51.3%), anxiety (66.9%) and stress (53%) were high even in medical college students of Bhubaneswar, Odisha in August 2012. Higher scores of depression, anxiety and stress was associated with female gender, lower semester, younger age and non smokers.¹²

A study conducted in Ambala among 1500 students of 13-19 years showed that overall prevalence of substance abuse was 60.0% for ever users and 34.93% for regular users. Substance abuse was more among male urban students. The most common substance abused among ever users was alcohol (44.49%) and among regular users was tobacco (14.42%). The mean age of the students was 15.2 years while the mean age of initiation of substance abuse was 14.5 years. It was observed that with increasing age the prevalence of substance abuse also increased and was statistically significant ($p<0.001$), while no such trend was observed in our study since majority of the students were in the age group of 16-17 years.¹³

Global School-based Student Health Survey (GSHS) conducted in India in 2007 showed anxiety was present in 7.7% of students aged 13-15 years, cigarette smoking (1.2%), current tobacco consumption (3.6%), ever alcohol used was 8%, multiple substance abuse (1.9%). Estimated suicidal rate was 35.5/ 1 lakh population while details of suicidal ideation and of attempts were not available.² In our study anxiety was present in 50.12%; cigarette smoking 3.1%, current tobacco consumption 31.1%, alcohol consumed in past one year was 3.1%, multiple substance abuse 6.2%. In

past 12 months 3.9% of them had attempted to suicide and 6.4% had positive family history of committing suicide. Comparing the result of these two studies shows that the burden of anxiety, suicide and substance abuse has been increased to a larger proportion over a period of time from 2007 to 2015.

Based on our study we would like to recommend that along with annual physical health check up mental health screening should also be conducted in the colleges followed by counselling facilities at the institutional level (made easily accessible) may help to alleviate the burden of depression, anxiety and stress. Early identification of students getting addicted from various substance abuse (alcohol, cigarette smoking, tobacco chewing, fluid inhalation, cough syrup, injectable drug abuse etc) is necessary to prevent them from becoming completely dependent on these substances or developing any complications medically or socially. Life skill education is the need of the hour and has to be strongly implemented into the curriculum there by students will be able to cope up with depression, anxiety and reduce stress.

The present study was conducted in only three colleges using convenient sampling technique. The probable reasons for depression, anxiety and stress were not collected. Also the probable reasons or situations as to why these adolescents got into substance abuse and why few of them had attempted to suicide were not collected. These were the limitations of our study.

CONCLUSION

Burden of depression, anxiety and stress was high among students and there association with suicide was significant. Stress was significantly associated with smokeless tobacco consumption & drug abuse.

REFERENCE

- Gururaj G, Varghese M, Benegal V, Rao GN, Pathak K, Singh LK and et al. National Mental Health Survey of India, 2015-16: Summary. Bengaluru, National Institute of Mental Health and Neuro Sciences, NIMHANS Publication No. 128, 2016 [Internet]. [cited 11 September 2017]. Available from: URL:<http://indianmhs.nimhans.ac.in/Docs/Summary.pdf>
- Mental health status of adolescents in South-East Asia: evidence for action [Internet]. WHO 2017 [cited 12 September 2017]. Available from: URL:<http://www.who.int/iris/handle/10665/254982>
- Adolescents: health risks and solutions. Fact sheet. [Internet]. WHO May 2017 [cited 10 September 2017]. Available from URL:<http://www.who.int/mediacentre/factsheets/fs345/en/>
- Strategy Handbook. Rashtriya Kishor Swasthya Karyakram [Internet]. National Health Mission. 2014 [cited 8 September 2017]. Available from URL:<http://nhm.gov.in/images/pdf/programmes/rksk-strategy-handbook.pdf>
- Priyanka S, Ankita T. A study on Adolescent Drug Abuse in India [Internet]. 2016 [cited 15 September 2017]. Available from URL:<http://iasir.net/AIJRHASSpapers/AIJRHASS16-244.pdf>
- ACCIDENTAL DEATHS & SUICIDES IN INDIA 2015 [Internet]. NCRB. 2015 [cited 5 September 2017]. Available from URL:<http://ncrb.nic.in/StatPublications/ADSI/ADSI2015/adsi-2015-full-report.pdf>
- Depression in India. Let's talk [Internet]. WHO. 2017 [cited 12 September 2017]. Available from URL:http://www.searo.who.int/india/depression_in_india.pdf
- Health - United Nations Sustainable Development [Internet]. United Nations Sustainable Development. [cited 15 September 2017]. Available from URL:<http://www.un.org/sustainabledevelopment/health/>
- Vani CH, Ranganath ST, Shobha B, Navya SS. Challenges to Harness India's Demographic Dividend: Are We on the Right Track? - A Cross Sectional Study in South India. Ntl J Community Med 2016; 7(8):695-699.
- Gomez F. A Guide to the Depression, Anxiety and Stress Scale (DASS 21) [Internet]. [cited 11 August 2015]. Available from URL:https://www.cesphn.org.au/images/mental_health/Frequently_Used/Outcome_Tools/Dass21.pdf
- Bhasin S, Sharma R, Saini N. Depression, anxiety and stress among adolescent students belonging to affluent families: A school-based study. The Indian Journal of Pediatrics [Internet]. 2009 [cited 14 September 2017];77(2):161-165. Available from URL:<http://medind.nic.in/icb/t10/i2/icbt10i2p161.pdf>
- Venkatarao E, Iqbal S, Gupta S. Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. Indian Journal of Medical Research [Internet]. 2015 [cited 5 September 2017];141(3):354. Available from URL:<http://icmr.nic.in/ijmr/2015/march/0313.pdf>
- Qadri S, Goel R, Singh J, Ahluwalia S, Pathak R, Bashir H. Prevalence and pattern of substance abuse among school children in northern India: A rapid assessment study. International Journal of Medical Science and Public Health [Internet]. 2013 [cited 5 September 2017];2(2):273. Available from URL:<https://www.ejmanager.com/mnstemp/67/67-1357047413.pdf>

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Comparative study of health status of migrant versus local workers' children in a tea plantation in Tamil Nadu, South India.

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Abstract

Introduction: The tea plantation industry in South India is facing a severe labour crisis leading to influx of large number of migrant workforce. Provision of good health services for migrant workers is a daunting challenge for health care providers and estate management. **Objective:** To compare the health, nutrition and immunization status of children of migrant workers with local children in tea plantations in Anamallai, Tamilnadu. **Methodology:** A cross sectional study along with a qualitative component was conducted between November and December 2014. A total of 110 children between the ages of 1-5 years attending 19 crèches through 7 estates were included. Socio demographic details, feeding practices and immunization status were captured using an interview schedule. Anthropometric parameters and physical examination findings were documented. FGDs and indepth interviews were conducted with various stakeholders. **Results:** Among 110 children assessed, 64 were locals and 46 were migrants. According to the WHO classification of nutritional status, about 8% and 7% of the local and 24% and 22% of the migrant children were underweight & stunted respectively. Only 13(29.5%) of migrant children were fully immunized for age compared to 100% of the local children. Health problems like ARI, worm infestation, rachitic changes & behavioral problems were more common in migrant children. Qualitative results depict that health seeking behavior is poor among migrants. **Conclusion:** The high prevalence of health problems, incomplete immunization and poor nutritional status is significantly higher among children of migrant workers compared to local children. Health seeking behavior is poor among migrants. Migrant sensitive policies, information systems and specific training to the health care delivery people to reach the unreached are the challenges. Integration and synergy with all the stakeholders and self-advocacy and participation from the migrants is also needed.

Key-words: Migrant children's health, plantation, comparative study, India.

Introduction:

In India 70% of the labour force is employed in the agriculture sector. Plantation being a part of agriculture directly employs more than 2 million workers in the country. India's total export earnings of agriculture products is about 15% from crops like tea, coffee and rubber.¹ India is one of the largest producer and consumer of tea in the world. India's tea plantations are largely grouped into 2 regions – North East India and South India. Assam and West Bengal are the important states in North East India. Tamil Nadu and Kerala are the important southern states.² The tea planting industry in southern India accounts for 66,050 planters and employs a population of about 2.46 lakh as labor.³ The tea plantation

industry in South India is facing a severe labour crisis, leading to influx of large number of migrant workforce.⁴ Provision of good health and health services for people here is a daunting challenge for the health care providers and policy makers.

In India, migrant labour makes enormous contribution to national economy (10% of GDP) and development but the migrants remain on the periphery of society with few citizen rights.¹ The National Commission on Rural Labour in India (NCRL, 1991) estimates more than 10 million circular migrants in the rural areas alone in the country.⁵ Studies and field evidences suggest that children accompanying their parents in the 0-14 age group may constitute one third of the total migrant population and

put the number of migrant children below 14 years close to 6 - 9 million.⁶ Migrants carry with them a health risk and public health implication due to their epidemiological profile, their exposure to infectious agents, their genetic and lifestyle related risk factors and culture based health beliefs.^{7,8}

Anthropometric standards by WHO are most reliable tools to assess child nutritional status everywhere in world regardless of ethnicity, socio-economic status, and type of feeding.⁹ With this background, the present study was conducted to compare the health, nutrition and immunization status between local and migrant children (1 to 5 years) of estates in tea plantations of Anamallai, Tamilnadu.

Methodology:

A cross sectional study along with a qualitative component in order to capture the reasons for the poor health was carried out among the children attending crèches in 7 tea estates of plantations in Anamallai, Tamilnadu. In the present study, people who moved to the area within the past one year or less have been considered as "migrants". The assessment has been focused on the tea plantation workers of Anamallai in South India. Majority of the migrant population in this area is from Jharkhand, Assam and a few families from Karnataka. The study was approved by the Institutional Ethics Committee. The study was done during the period of November and December, 2014. The study population comprised of children between the ages of 1-5 years.

Permission was obtained from the concerned authorities. The plantation act (1951) mandates the provision of creche facilities by the estate management for workers, to care for their children under five years, while they are at work. All the 19 crèches with around 20-30 located in the 7 estates were visited. Children who were critically ill or were unavailable during the interviews, family circumstances and who were on vacation were excluded from the study. A verbal and written informed consent was obtained from the crèche teachers and mother. An interview schedule was developed to capture data regarding socio demographic details, immunization status, feeding practices and information pertaining to migration. Fully immunized children means, a child who has received BCG, three doses of DPT, OPV and measles before one year of age. The Strengths and Difficulties Questionnaire (SDQ)¹³ was used to assess behavioral problems among children.

Anthropometric measurements of the children were documented. The data included weight, recumbent length (for children less than 24 months of age), height (for children more than 24 months of age and mid arm circumference. Weight was measured to the nearest 0.1 Kg and Salter weighing machine was used for weight measurement. Height was measured against a non-

stretchable tape fixed to a vertical wall, with the participant standing on a firm/level surface and it was measured to the nearest 0.5 cm. Recumbent length (for children less than 24 months of age) was measured by using an infant measuring board. Mid arm circumference was measured using non stretchable tape. The children were dressed in light underclothing and without any shoes during the measurement. The same measuring equipment was used throughout the study. The WHO growth standards were used to interpret the anthropometric data.⁹ Indicators used for determining under nutrition were categorised as under weight (weight for age), wasting (weight for height) and stunting (height for age). Anthropometry was put into categories based on WHO growth charts. This was followed by a thorough head to toe general and systemic examination.

A qualitative study was also conducted by means of focused group discussion with both local and migrant mothers of children under 5 years of age and in depth interviews with the village health nurse (VHN), crèche teachers, both local and migrant mothers of children under 5 years of age. The Focus group discussions covered topics of breast feeding, exclusive breast feeding, pre lacteal feeds, weaning, facilities available at the crèche, special food available at the crèche for children with severe acute malnutrition (SAM), about immunization and the difficulties encountered by both the migrant and the local population. Participants were purposively selected to provide a representative configuration under the objectives of our study.

Statistics and analysis of the data:

The data were entered and coded in Microsoft Excel and analyzed using SPSS version 16 for proportions, frequencies and associations. Measures of central tendency, dispersion and chi square tests and regression analysis were used to analyze the data. We considered p value of <0.05 as significant. When more than 20% of cells in tables had value less than 5, then we considered Fischer's exact test for significance. Thematic analysis of qualitative data from IDIs was done by coding in a two-step process: key phrases were coded into a framework that was based on the topic guide, and additional themes that emerged from the data were added to the framework. Data were then recoded using the revised framework.

Results:

Among the 110 children (for whom the complete details could be collected) included in the study, 65(59.1%) were under 3 years of age. According to B G Prasad classification of socioeconomic status 75(68.2%) belonged to the middle class. Majority of the children belonged to nuclear family (77.8%) followed by three generation family (18.5%). Of the 78 children whose birth details were available, the occurrence of normal vaginal deliveries was 85.9% and through Caesarean section was

14.1%. Around 87% and 79% of the local and migrant children were born of institutional deliveries and most of them were term babies (96.1%). The age and gender distribution of the migrant and local children is depicted in table 1.

Table 1- Age and gender distribution [n=110]

Age (in months)	Local (64)		Migrant (46)		Total
	Males	Females	Males	Females	
0-12	2(3.1)	1(1.5)	1(2.1)	2(4.3)	6(5.5)
13-24	1(1.5)	3(4.9)	2(4.3)	0(0)	6(5.5)
25-36	7(10.9)	6(9.6)	2(4.3)	3(6.5)	18(16.4)
37-48	11(17.1)	7(10.9)	8(17.4)	6(13.3)	32(29.1)
49-60	12(18.7)	14(21.8)	9(19.6)	13(28.3)	48(43.5)
Total	33(51.3)	31(48.7)	22(47.7)	24(52.3)	110(100)

*Numbers in parenthesis indicates percentage

Table 2 - Nutritional status of the children

Nutritional status	Origin		Total	p value
	Local	Migrant		
Normal	51 (79.6)	24 (52.1)	75 (68.1)	0.1
Underweight	5 (7.8)	11 (23.9)	16 (14.5)	<0.05*
Wasted	4 (6.2)	14 (30.4)	5 (4.5)	<0.05*
Stunted	3(4.6)	12(26.1)	14 (12.7)	<0.05*

*statistically significant at 5% level

When compared with the WHO anthropometric standards, around 8% & 6% of the local children were underweight & stunted while 24% & 22% of the migrant children were underweight &stunted. Also, around 5 & 4 % of the local children had low Body Mass Index (BMI) and low Mid Upper Arm Circumference (MAC) which is less than 12.5 cms, while 11 & 12% of the migrant children had low BMI and low MAC and the proportions were statistically significant between the two groups.

Table 3- Exclusive breast feeding

CATEGORY	LOCAL	MIGRANT	χ ²	p value
Exclusive Breast Feeding	54(84.3)	40(86.9)	0.14	0.7
Late initiation	1(1.7)	7(33.7)	30	<0.001*
Colostrum	58(96.7)	14(66.7)	14.1	<0.001*
Pre lacteal feeds	3(4.7)	18(39.1)	22.5	<0.001*

*statistically significant at 0.1% level

Exclusive breast feeding for 6 months was almost same in both the local and migrant children, while late initiation of breast feeding (after 12 hours) was found to be more prevalent amongst the migrant population 7(33.7%) as compared to 1(1.7%) of the local population. The practice

of giving pre lacteal feeds was also significantly more among the migrants. Cow's milk and honey were the most common pre lacteal feed. The practice of giving colostrum was significantly higher in the local population 58(96.7%) when compared to the migrant population.

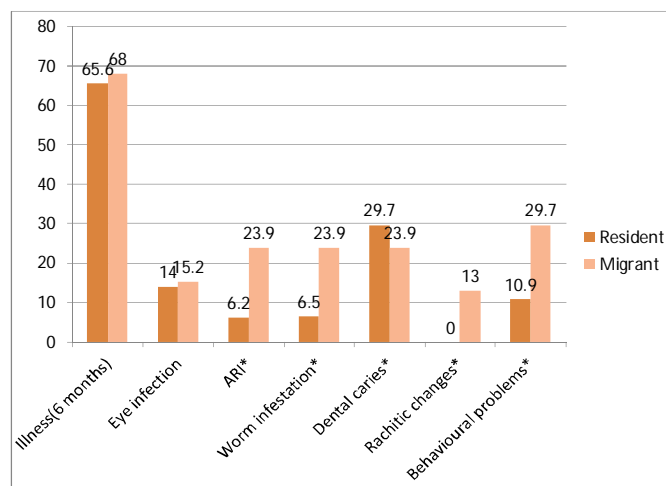
Table 4- Immunization status

Immunization	Origin		Total
	Local	Migrant	
Full	64 (100)	13 (29.5)	77 (71.3)
Partial	0 (0)	31 (70.5)	31 (28.7)
Total	64	44	108

Chi-square: 63.244 p <0.001

All the local children were fully immunized 64(100%) while only 31(70.5%) out of the 44 migrant children whose immunization history was available were fully immunized.

Fig 1: Health status of migrant and resident children



* P<0.05

Health status – Health problems like Acute Respiratory Infection (ARI), worm infestation, rachitic changes & behavioral problems are more common in migrant children as shown in the above graph.(Fig 1)

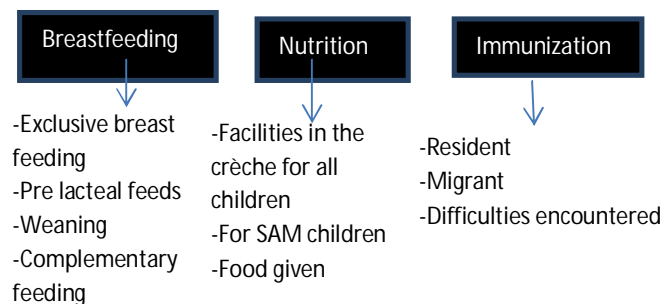
Table5: Comparison of factors between migrant and local children: Multivariate logistic regression analysis

Factors	Local	Migrant	OR (95% CI)
Pre lacteal feeds given	3(4.7)	18(39.1)	8.3* (5.6-16.9)
Partial immunisation	0(0)	31(70.5)	11.5* (6.8-23.7)
ARI	4(6.2)	11(23.9)	6.4* (3.4-20.7)
Worm infestation	3(6.5)	11(23.9)	5.3* (4.5-18.3)
Rachitic changes	0(0)	6(13)	9.1* (3.4-17.7)

* P<0.05

In the multiple logistic regression analysis (Table 5), pre lacteal feeds, partial immunization, ARI, worm infestation and rachitic changes were all found to be significantly higher among the migrant children.

Fig 2: Thematic tree of the developed themes



Results of FGDs showed that migrant mothers have adopted the cultural and traditional practices with respect to breastfeeding practices. The practice of immunization is poor due to poor knowledge, access and utilization of the health care system before migration. At the same time they were also not aware of the importance of vaccines in preventing diseases and death of the children. The migrant mothers' nutrition practices were different from locals in that they are not taking extra food.

The in-depth interviews conducted with each interview lasting for about 30 minutes. Some of the striking statements heard during the interviews are as follows:

- Migrant mother -“I have confusion in immunization of my child and I have no record of it.”
- Local mother 1- “My children are growing adequately in height and weight.
- Crèche teacher- “ The migrant children are not enrolled in crèche, because their parents are not interested and unaware of the benefits of crèche compared to local children”
- VHN- “I feel that migrant children are not healthy and there is a communication problem with their parents. They will come and go, so difficult to trace.”

Discussion:

In our study aiming to compare the health, nutrition and immunization status of both local and migrant children, upon calculating the nutrition status and comparing with the WHO standards, undernourishment was found to be a significant problem among the migrant children (23.9%). This is low in compared with the UNICEF (61%)⁹ and Kolkata study (64%).¹⁰ The prevalence of under nutrition (Table 2) is also considerably lower than the national average (43% underweight, 20% wasted, 48% stunted).¹¹ This facts brings into light the need for education of the parents of migrant population regarding adequate growth of the children, energy and protein rich food substances available in the local region. It again underlines the need for better growth monitoring and maintenance of health

records of these children so as to identify the problem of undernourishment and take necessary steps like educating parents about nutritious food, providing the special food preparation made available at the crèches for SAM children. The crèches in these estates provide the mid-day meal along with 250 ml of milk and half egg per child per day. The children of the local population attend the crèche regularly when compared to the children of the migrant population. This could have also contributed to better nutritional status of the local children.

Exclusive breast feeding for 6 months was almost same in both the local and migrant children and it's very good to know. Late initiation of breast feeding was found to be more prevalent amongst the migrant population 7(33.7%) as compared to 1(1.7%) of the local population. The practice of giving pre lacteal feeds was also significantly more (39%) among the migrants but was low compared to NFHS 3¹¹ survey (59%). The practice of giving colostrum was significantly higher in the local population 58(96.7%). Continuous health education by the health team in the labour lines and during antenatal check-up in the hospital has contributed to this behavior change among the local population.

The prevalence of fully immunized children amongst the local population in our study was 100% but that of migrant population was 29.5% showing a significant difference between the two groups. This low prevalence of complete immunization amongst the migrant population is consistent with previous studies conducted by UNICEF in Odisha⁹ among migrant population in 2011 (19%) and a study conducted among migratory children of brick kiln population in Kolkata in 2001(0%), albeit higher than the results obtained in both these studies. Once again the health education, record keeping and follow-up by the health functionaries on the estate has contributed to complete immunization among local population.

Health problems like ARI, worm infestation, Rachitic changes & behavioral problems were more common in migrant children. Only two children had diarrhoea while this low prevalence of diarrhoea may be due to the beneficial effects of consuming safe and wholesome water provided by the estate management.

Qualitative study reveals that – health seeking behavior is poor among migrants. The Focus group discussions and the in depth interviews concluded that the knowledge, attitude and practice of the migrant mothers about nutrition, immunization and health of their children was poor and highlight the need for strengthening further information, education and communication programs. .

Conclusion:The study brings into light the overall poor nutrition, immunization and health status of the migrant children. This brings forth a need for better planning of providing immunization and health education to this

population. Language barriers need to be overcome by utilizing the school teachers and educated adolescent on the estate to educate the migrant population. Policies and programmes for the migrant workers children with special emphasis to maintain records for migrant children with respect to immunization, growth chart, crèche attendance, etc. Instructions need to be given to the VHN/link workers to give a special focus to migrant children.

Migrant sensitive policies, information systems and specific training to the health care delivery people to reach the unreached are the challenges. Integration and synergy with all the stakeholders and self-advocacy and participation from the migrants is also needed.

References:

1. Socioeconomic condition among women workers in plantation industry. A report by Government of India, Ministry of Labour & Employment, Labour Bureau, Chandigarh. 2008-2009;
2. Available at <http://www.cds.ac.in/krcpds/report/TEAWORKER.pdf>. Accessed on 14.02.2014
3. United Planters Association of Southern India. The Planters' Chronicle. 2001; 158-9.
4. Muthiah S. Madras. Affiliated East-West Press Pvt; A Planting Century. 1993; 329-9.
5. National Commission on Rural Labour in India Report. Available from <http://www.prsindia.org/uploads/media/1237548159/NLCII-report.pdf>
6. State of the World's Children report. Unicef.2015; Available from https://www.unicef.org/publications/index_77998.html. Accessed on 10-11-2017
7. Kulwa KB, Kinabo JL, Modest B. Constraints on good child-care practices and nutritional status in urban Dar-es-Salaam, Tanzania. Food Nutr Bull.2006; 27:236-44.
8. Tamoghna B, Pankaj K M, Samrendra B. Assessment of health, nutrition and immunization status amongst under -5 children in migratory brick kiln population of peri urban Kolkata, India. Sudanese Journal of Public Health.2011; 6:1-13.
9. De Onis M, Garza C, Onyango AW, Rolland-Cachera MF. le Comitéde nutrition de la Société française de pédiatrie. WHO growth standards for infants and young children. Arch Pediatr. 2009; 16:47-53.
10. Tamoghna et al. Assessment of Health, Nutrition and Immunisation status amongst under -5 children in migratory brick kiln population of periurban Kolkata, India. Sudanese Journal of Public health. 2011;(6):1
11. Ministry of Health and Family Welfare. National Family Health Survey III. New Delhi: Government of India; 2005-2006.
12. S. Goel, S. Bali, A. Singh. Impact of a Short Term Intervention on Health Care Outreach to a Marginal Population in Rural North India. The Internet Journal of Health. 2007; 5 (2).
13. Strengths and Difficulties Questionnaire (SDQ). Available from <http://www.sdqinfo.com/b7.html>. SOURCE: Mental Health National Outcomes and Casemix Collection: Overview of Clinician-Rated and Consumer Self-Report Measures V1.50, Mental Health & Suicide Prevention Branch, Department of Health and Ageing

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