

Review Article

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Health behaviours & problems among young people in India: Cause for concern & call for action

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The young people in the age group of 10-24 yr in India constitutes one of the precious resources of India characterized by growth and development and is a phase of vulnerability often influenced by several intrinsic and extrinsic factors that affect their health and safety. Nearly 10-30 per cent of young people suffer from health impacting behaviours and conditions that need urgent attention of policy makers and public health professionals. Nutritional disorders (both malnutrition and over-nutrition), tobacco use, harmful alcohol use, other substance use, high risk sexual behaviours, stress, common mental disorders, and injuries (road traffic injuries, suicides, violence of different types) specifically affect this population and have long lasting impact. Multiple behaviours and conditions often coexist in the same individual adding a cumulative risk for their poor health. Many of these being precursors and determinants of non communicable diseases (NCDs) including mental and neurological disorders and injuries place a heavy burden on Indian society in terms of mortality, morbidity, disability and socio-economic losses. Many health policies and programmes have focused on prioritized individual health problems and integrated (both vertical and horizontal) coordinated approaches are found lacking. Healthy life-style and health promotion policies and programmes that are central for health of youth, driven by robust population-based studies are required in India which will also address the growing tide of NCDs and injuries.

Key words Health promotion - high risk sexual behaviours - India - mental health problems - nutrition disorders - road traffic injuries - substance use - suicides - young people

Introduction

Young people form precious human resources in every country. However, there is considerable ambiguity in the definition of young people and terms like young, adolescents, adults, young adults are often used interchangeably. World Health Organization (WHO) defines 'adolescence' as age spanning 10 to 19 yr, "youth" as those in 15-24 yr age group and

these two overlapping age groups as "young people" covering the age group of 10-24 yr¹. Adults include a broader age range and all those in 20 to 64 yr². Adolescence is further divided into early adolescence (11-14 yr), middle adolescence (15-17 yr), and late adolescence (18-21 yr)³. Individuals in the age group of 20 - 24 yr are also referred to as young adults⁴. The National Youth Policy of India (2003) defines the youth population as those in the age group of 15-35 yr⁵.

Population aged 10-24 years accounts for 373 million (30.9%) of the 1,210 million of India's population with every third person belonging to this age group. Among them, 110 and 273 million live in urban and rural India, respectively. Males account for 195 million and females 178 million, respectively⁶. As per the National Sample Survey (NSS), (2007-08) 32.8 per cent of this group attend educational institutions and 46 per cent (2004-05) are employed⁷.

What characterizes adolescents and youth?

Youth - the critical phase of life, is a period of major physical, physiological, psychological, and behavioural changes with changing patterns of social interactions and relationships. Youth is the window of opportunity that sets the stage for a healthy and productive adulthood and to reduce the likelihood of health problems in later years. A myriad of biological changes occur during puberty including increase in height and weight, completion of skeletal growth accompanied by an increase in skeletal mass, sexual maturation and changes in body composition. The succession of these events during puberty is generally consistent among the adolescents often influenced by age of onset, gender, duration, along with the individual variations. These changes are also accompanied by significant stress on young people and those around them, while influencing and affecting their relationships with their peers and adults. It is also an age of impulsivity accompanied by vulnerability, influenced by peer groups and media that result in changes in perception and practice, and characterized by decision making skills/abilities along with acquisition of new emotional, cognitive and social skills³.

Young people's health is vital and crucial

Most young people are presumed to be healthy but, as per WHO, an estimated 2.6 million young people aged 10 to 24 yr die each year and a much greater number of young people suffer from illnesses 'behaviours' which hinder their ability to grow and develop to their full potential. Nearly two-thirds of premature deaths and one-third of the total disease burden in adults are associated with conditions or behaviours initiated in their youth (*e.g.* tobacco use, physical inactivity, high risk sexual behaviours, injury and violence and others)⁸. The behavioural patterns established during this developmental phase determine their current health status and the risk for developing some chronic diseases in later years⁹. A significant reduction in the

mortality and morbidity of communicable, maternal and neonatal disorders since 1990 due to concerted and integrated efforts^{10,11} led to a shift in focus towards the health, safety and survival of the young people. It is crucial to understand health problems of this population, processes and mechanisms that affect their health, identify interventions and strategic approaches that protect their health and develop and implement policies and programmes.

The present review focuses on the health behaviours and problems affecting young people in the age group of 10-30 yr in India. The review also examines some policy initiatives and interventions and identifies issues that need to be addressed for health and safety of young people in India.

Review methods

All available population based studies (with large sample size, being multicentric in nature, covering urban and rural areas), independent studies and reports published since 2001 were considered. Searches were conducted using PubMed, Medline, Ovid, Karger, ProQuest, Sage Journals, Science Direct, Springer, Taylor & Francis and Wiley Online Library. Various search terms and key words were used, including young, youth, adolescent, young adult and outcomes of interest namely undernutrition, obesity, overweight, common mental health problems, stress, depression, suicide, alcohol, tobacco use, substance use, violence and road traffic injury. All efforts were made to retrieve the unpublished reports by contacting individual researchers. Case reports and case series were excluded from the search.

From a methodological perspective, majority of the studies were cross-sectional in nature, on varying sample size and undertaken in urban and rural (or both) areas. As there are no comprehensive studies that have focussed on all health problems of this age group, studies have been individualistic in nature based on researchers' and/or organisational interest. Further, definitions used for age cut-offs and condition under investigation, screening and diagnostic assessments, nature of study, reporting bias, statistical methods add to the complexities of the problem and thus, studies are non-comparable in nature.

Health problems of young people

Although adolescence and young adulthood are generally considered healthy times of life, several important public health and social behaviours and

problems either start or peak during these years¹². Most of these problems are linked with social determinants and lifestyles operating and interacting in complex environments that precipitate or trigger these conditions or behaviours. Developmental transition of young people make them vulnerable particularly to environmental, contextual or surrounding influences¹³. Environmental factors, including family, peer group, school, neighbourhood, policies, and societal cues, can both support or challenge young people's health and well-being¹².

Available evidence indicates that young people are prone to a number of health impacting conditions due to personal choices, environmental influences and lifestyle changes including both communicable and non-communicable disorders and injuries. Others include substance use disorders (tobacco, alcohol and others), road traffic injuries (RTIs), suicides (completed and attempted), sexually transmitted infections (STI) including human immunodeficiency virus (HIV) infection, teen and unplanned pregnancies, homelessness, violence and several others. In all countries, whether developing, transitional or developed, disabilities and acute and chronic illnesses are often induced or compounded by economic hardship, unemployment, sanctions, restrictions, poverty or poorly distributed wealth at both individual and country level¹⁴.

Undernutrition and micronutrient deficiencies

Data shown in Table I indicate a high prevalence of undernutrition and stunting in the age group of 10-30 yr that has an adverse bearing on their health. Data from Nutrition Survey of National Institute of Nutrition during 2001 and 2006 showed that more than half the population aged 10-18 yr was undernourished^{15,16}. This observation is also supported by other studies with sample size varying from 500 to 1000 with the prevalence of undernutrition in 10 to 24 yr ranging from 56.4 to 68.5 per cent¹⁷⁻¹⁹. A school based study showed that 38.8 per cent of boys and 36.9 per cent of girls were stunted²⁰, while a community based study showed that 51.7 per cent adolescents were stunted¹⁸. The prevalence of micronutrient deficiencies in rural area was as high as 25 per cent as reported by Choudhary *et al*¹⁹ with high prevalence of anaemia, more among girls, ranging from 30-82 per cent^{17,18,21}. Anaemic adolescent mothers are at a high risk of miscarriage, maternal mortality and still births; also, low birth weight babies with low iron reserves²⁴. Poor nutritional status of adolescents is an outcome of

socio-cultural, economic and public policies relating to household food security compounded by behavioural dimensions.

Overweight and obesity

Conversely, overweight and obesity - another form of malnutrition with serious health consequences is increasing among other young people in India and other Low Middle Income Countries (LMICs)⁸. A meta-analysis of nine studies in 2012 showed 12.6 per cent of children to be overweight and 3.3 per cent to be obese indicating the seriousness of the situation²³. A review of a few select studies (Table II) during 2001 to 2012 showed a prevalence of overweight among children aged 10-19 yr to be 9.9 to 19.9 per cent; high in both boys (3 to 15.1%) and girls (5.3 to 13.3%) indicating early onset of obesity^{26-31,33} affecting more of urban school adolescents (3.4 to 6.5%)^{26-28,32} as compared to 0.6 per cent among the rural adolescents¹⁵ with significant gender variations^{26,29,32}. Studies from Karnataka^{27,32} have shown a higher prevalence of obesity as compared to studies from northern India^{26,28,30}. It is clear that India is facing the dual burden of undernutrition and overnutrition as also seen from other reports^{34,35}. There is also a challenge of nutritional transition as Indians are moving away from traditional diets high in cereal and fiber to more western pattern diets high in sugars, fat, and animal-source food (fast food culture) that are closely associated with different non communicable diseases (NCDs) seen in later years^{36,37}.

High risk sexual behaviour

High-risk sexual behaviour is a broad term covering early sexual activity especially before 18 years of age and includes unprotected intercourse without male or female condom use except in a long-term, single-partner (monogamous) relationship, unprotected mouth-to-genital contact except in a long-term monogamous relationship, having multiple sex partners, having a high-risk partner (one who has multiple sex partners or other risk factors), exchange of sex (sex work) for drugs or money, having anal sex or having a partner who does except in a long-term, single-partner (monogamous) relationship and having sex with a partner who injects or has ever injected drugs³⁸. It is a known risk factor that puts individuals at risk for contracting HIV/AIDS and a range of other sexually transmitted diseases like gonorrhoea, herpes, genital warts, Chlamydia, syphilis, trichomoniasis, *etc.* The National Family Health Survey (NFHS) 3 (2005-06) indicated that 4 per cent of young women and 15

Table I. Status of undernutrition and micronutrient deficiency in India

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
National level surveys						
Parasuraman <i>et al</i> ²¹	2009	India	National level study	47,590 women and 24,997 men aged 15-24 yr selected by multistage stratified sampling	Structured questionnaire	44 per cent women and 47 per cent men aged 15-24 yr were abnormally thin. 56 per cent of women and 25 per cent of men were anaemic
National Nutritional Monitoring Bureau (NNMB) ¹⁶	2006	Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat, Orissa and West Bengal	Surveys among rural populations	51,700 population of which 5530 adolescents aged 12-17 yr were covered for dietary information selected by two stage stratified random sampling	Nutrition assessment using anthropometry (NCHS standards), clinical examination, diet survey	Prevalence of undernutrition 38 per cent in both 10-13 yr and 14-17 yr age group, micronutrient deficiencies ranged from 1 to 3 per cent
NNMB ¹⁵	2001	Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu and West Bengal	Surveys among rural populations	51,239 population of all age group selected by two stage stratified random sampling covered of which adolescents were part	Nutrition assessment using anthropometry, clinical examination, diet survey	78 per cent of the surveyed population in 10-13 yr and 66 per cent in 14-17 yr age group were observed to be undernourished. Micronutrient deficiencies ranged from 1 to 2 per cent
Select studies						
Wasnik <i>et al</i> ¹⁷	2012	Vizianagaram, Andhra Pradesh	Cross-sectional study in urban area	420 girls aged 10-15 yr	Pre-designed, pretested, semi-structured schedule; anthropometric measurements recorded using standardized methodology as recommended by WHO	56.4 per cent girls were undernourished. 25.2, 15.2 and 16 per cent of the girls were suffering from chronic energy deficiency grade I, II and III, respectively, and 30 per cent of them were anaemic
Maliye <i>et al</i> ²²	2010	Sewagram, Wardha	Cross-sectional study in the rural area	430 unmarried adolescent girls aged 10-19 yr	Pre-designed and pretested questionnaire; CDC 2000 reference used to assess the nutritional status	57 per cent of the adolescent girls were thin
Haboubi <i>et al</i> ²⁰	2009	Kerala, Tamil Nadu and the UAE	School based cross-sectional survey	2459 adolescent boys and girls aged 10 and 16 yr (1200 from India and 1259 from UAE)	Adolescents falling below the age & gender-specific 5 th and 3 rd percentiles of the WHO recommended standards	India specific data showed that 38.8 per cent of boys and 36.9 per cent girls were stunted and 64.6 per cent boys and 50.1 per cent girls were thin

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Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Deshmukh <i>et al</i> ²³	2006	Wardha, Maharashtra	Community based cross-sectional study in rural area	764 adolescents selected by two stage sampling method	Nutritional status classified using mean BMI for age with CDC 2000 reference	53.8 per cent of the adolescent were thin, 75.3 per cent of them had chronic energy deficiency and 20.8 per cent had wasting
Rao <i>et al</i> ¹⁸	2003	Kundam Blocks of Jabalpur, Madhya Pradesh	Community based rural study	818 adolescent boys and girls aged 11-19 yr selected by probability proportional to size sampling technique	Nutritional status was assessed using NCHS reference data with anthropometric measurements taken using standardised techniques	61.7 per cent adolescents were underweight and 51.7 per cent stunted. Wasting was observed in 32.8 per cent adolescents. In adolescent boys and girls with anaemia prevalence rate was 82.3 per cent
Choudhary <i>et al</i> ¹⁹	2003	Chiraigaon Block of Varanasi, Uttar Pradesh	Cross-sectional community-based rural study	270 adolescent girls selected by simple random sampling	Nutritional status assessed by weight for age, height for age, weight for height, MAC for age and BMI at different age points	68.52 per cent adolescent girls were underweight (BMI < 18.5 kg/m ²). 19.63 per cent adolescent girls suffered from CED grade-I; corresponding value for grade-II and grade-III was 17.78 and 31.11 per cent, respectively. Micronutrient deficiencies ranged from 3 to 25 per cent

WHO, World Health Organization; CDC, Centers for Disease Control and Prevention; UAE, United Arab Emirates; PHC, Primary Health Centre; BMI, body mass index; NCHS, National Center for Health Statistics; MAC, mid arm circumference; CED, chronic energy deficiency; NNMB, National Nutritional Monitoring Bureau

per cent of young men had ever experienced sex before marriage and only 14.1 per cent (14.7% urban vs 13.9% rural) of unmarried sexually active adolescent females used a contraceptive³⁹. Young people aged 15 to 24 yr commonly engage in premarital sex more so in men (15-22%) as compared to women (1-6%)³⁹⁻⁴³. Kumar *et al*⁴⁰ in a study of 2,475 never married boys and girls noticed that only 22.3 per cent males and 6.3 per cent females reported consistent condom use for premarital sex in the last 6 months. A study from Gujarat observed that nearly 40 per cent males and 7.4 per cent females in the age group of 15 to 24 yr reported having multiple-partner sex, while 32.1 per cent males and 3.2 per cent females reported having paid/exchange (money/gift) sex⁴⁴. Thus, data shown in Table III indicate that prevalence of high risk sexual behaviour among the

young people is not only high but vary widely across studies and needs immediate attention to reduce the occurrence of HIV and related diseases.

Common mental disorders

At least 20 per cent of young people are likely to experience some form of mental illness - such as depression, mood disturbances, substance abuse, suicidal behaviours, eating disorders and others⁸. A meta-analysis of five psychiatric epidemiological studies yielded an estimated prevalence of mental morbidity including 16 mental and behavioural disorders (classified into eight groups of organic psychosis, schizophrenia, manic affective psychosis, manic depression, endogenous depression, mental retardation, epilepsy, phobia, generalized anxiety,

Table II. Prevalence of overweight and obesity as reported in Indian studies

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
National level survey						
Midha <i>et al</i> ²⁵	2012	India	Meta analysis of nine studies	67,919 children for obesity and 92,862 children for overweight aged 2 to 19 yr were included for analysis	CDC/WHO criteria for classification of obesity	Prevalence of overweight and obesity was 12.64 and 3.39 per cent respectively. The overall prevalence rate was 12.64 per cent.
NNMB ¹⁵	2001	Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu and West Bengal	Surveys among rural populations	51,239 population covered, of which adolescents were part selected by two stage stratified random sampling	Nutrition assessment using anthropometry, clinical examination, diet survey	Prevalence of obesity among rural adolescents was 0.6 per cent
Select studies						
Goyal <i>et al</i> ²⁶	2011	Surat city, Gujarat	Urban cross-sectional study of two private schools	1209 adolescents aged 12 to 15 yr selected by simple random sampling	Predefined and pretested questionnaire along with weight measurement using Growth Monitoring Guidelines as recommended by IAP	Prevalence of overweight and obesity was 13.9 and 6.55 per cent (boys 15.1% and 6.7 per cent; girls: 13.35 and 6.4 per cent), respectively
Kotian <i>et al</i> ²⁷	2010	Mangalore, Karnataka	School-based cross-sectional study in urban area	900 adolescents aged 12 to 15 yr selected by multistage stratified random sampling	Questionnaire and anthropometric measurements	Prevalence of overweight and obesity 9.9 and 4.8 per cent, respectively
Aggarwal <i>et al</i> ²⁸	2008	Ludhiana, Punjab	School based cross-sectional study representing affluent schools in urban area	1000 adolescents selected by random and purposive sampling	Prevalidated questionnaire; anthropometry using international cut-off points for the body mass index; BMI $\geq 95^{\text{th}}$ percentile for age and sex considered as obese and BMI $\geq 85^{\text{th}}$ percentile considered as overweight	Prevalence of overweight among boys and girls was 15 and 10.2 per cent, respectively and overall prevalence of obesity was 3.4 per cent

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Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Laxmaiah <i>et al</i> ²⁹	2007	Hyderabad, Andhra Pradesh	School based cross-sectional study in urban area	1150 children aged 12 to 17 yr selected by multistage stratified cluster sampling	Overweight and obesity assessment as defined by the IOTF	Prevalence of overweight was 6.1 per cent among boys & 8.2 per cent among girls; Obesity prevalence was 1.6 and 1.0 per cent, respectively
Kumar <i>et al</i> ³²	2007	Davangere, Karnataka	Urban School based cross-sectional study followed by case control study	1496 school children aged 10 to 15 yr	Calculation of BMI based on KN Agarwal percentiles	Overall prevalence of obesity was 5.74 per cent with rates of 4.4 per cent among boys and 8.8 per cent in girls
Mehta <i>et al</i> ³⁰	2007	Delhi	Urban school based cross-sectional study	414 girls aged 16-17 yr selected by random sampling	BMI ≥ 30 kg/m ² (<i>i.e.</i> $\geq 95^{\text{th}}$ percentile) denotes obesity and BMI ≥ 25 kg/m ² (<i>i.e.</i> $\geq 85^{\text{th}}$ percentile) denotes overweight as according to IOTF criteria	Prevalence of overweight among girls was 15.2 per cent and obesity was 5.3 per cent
Khadilkar <i>et al</i> ³¹	2004	Pune, Maharashtra	Urban school based cross sectional study	1228 boys aged 10-15 yr selected by stratified random sampling	The international criteria for body mass index used for classifying children as overweight and obese. Indian standards for 85 th and 95 th percentile were adapted	Prevalence of overweight was 19.9 per cent and obesity 5.7 per cent

WHO, World Health Organization; CDC, Centers for Disease Control and Prevention; IAP, Indian Academy of Pediatrics; BMI, body mass index; IOTF, International Obesity Task Force; NNMB, National Nutritional Monitoring Bureau

neurotic depression, obsession and compulsion, hysteria, alcohol/drug addiction, somatisation, personality disorders and behavioural/emotional disorders) of 22.2 per 1000 population among 15 to 24 years⁴⁷.

Data available from community based studies on common mental disorders in India depict a high prevalence among the young people (Table IV), but comparisons and extrapolations need to be cautiously made due to variations across studies. The prevalence of overall psychiatry morbidity (depression, conduct disorder, social anxiety, panic disorder) among adolescents has varied from 12 to 16.5 per cent^{48,49}.

Pillai *et al* observed a low prevalence of 1.8 per cent of DSM-IV disorders among adolescents aged 12-16 yr which was attributed to methodological factors and the presence of protective factors⁵⁰. A six years follow up study in Chandigarh showed the incidence rate of psychiatric disorder to be 0.18 per cent per year among the 10-17 yr old adolescents⁵¹. Among the few specific common mental disorders, the prevalence of depression has varied from 0.1 to 18.5 per cent^{48,49,52-55}, conduct disorders from 0.2 to 9.2 per cent^{48,49,53}, and anxiety from 0.1 to 24.4 per cent^{48-50,53,55,56} across different studies. Two studies showed prevalence of severe and extreme grade of depression in 11.2 per

Table III. Prevalence of high risk sexual behaviour among young Indians

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
National level surveys						
Gaffey <i>et al</i> ⁴⁵	2011	India	National level study	31040 men aged 15-49 yr selected by multi-stage, stratified cluster sampling	Study specific questionnaire	Among men aged 15-24 yr, 35.7 per cent of unmarried, married or previously married men had sex with non regular partners and 7.9 per cent had sex with FSW; 62.9 per cent of unmarried men had sex with non regular partners and 13.3 per cent had sex with FSW; 6.5 per cent of married men had sex with non regular partners & 1.9 per cent of married men had sex with FSW
NFHS-3 ³⁹	2007	India	Population based study in rural and urban settings	124,385 women aged 15-49 yr and 74,369 men aged 15-54 yr	Study specific questionnaire	4 per cent of young women and 15 per cent of young men had ever experienced sex before marriage, only 14.1 per cent (14.7% urban versus 13.9% rural) of unmarried sexually active adolescent females used a contraceptive
Santhya <i>et al</i> ⁴¹	2008	Andhra Pradesh, Bihar, Jharkhand, Maharashtra, Rajasthan & Tamil Nadu	Population based survey in rural and urban settings	31,274 young women and 14,281 young men aged 15-24 selected by systematic, multi-stage sampling design	Study specific structured questionnaire	4 per cent of young women and 15 per cent of young men had ever experienced sex before marriage. Less than 1 per cent of young men reported same-sex relations, while relations with sex workers and married women were reported by 1 and 3 per cent of young men, respectively
Select studies						
Ghule <i>et al</i> ⁴⁶	2011	Thane, Maharashtra	Institution based cross-sectional study in rural area	1500 students (800 male and 700 female) aged 5-24 yr selected by random sampling	Self-administered questionnaire	11 per cent boys and 1 per cent girls reported penetrative sex (vaginal/oral/anal), and around half of them did not use condom. Homosexual experience was reported by 11 per cent boys and 3 per cent girls
Kumar <i>et al</i> ⁴⁰	2011	Guntur district, Andhra Pradesh	Population-based cross-sectional study in rural and urban area	2,475 never married boys and girls aged 15-24 yr selected by systematic sampling	Interviews	21.7 per cent males and 4.6 per cent females reported having had premarital sex. Only 22.3 per cent males and 6.3 per cent females reported consistent condom use for premarital sex in the last 6 months

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Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Sujay ⁴⁴	2009	Gujarat	Cross-sectional survey in three university settings in urban area	3,202 college students aged 15-24 yr selected by stratified two-stage random sampling	Self-administered, anonymous questionnaires	39.7 per cent males and 7.4 per cent females reported having multiple-partner sex and 32.1 per cent males and 3.2 per cent females reported having paid/exchange (money/gift) sex
Alexander <i>et al</i> ⁴²	2007	Pune, Maharashtra	Community-based study in urban slum and rural settings	15-24 yr	Study specific questionnaire	16-18 per cent of young men and 1-2 per cent of young women had premarital sex
Savithri <i>et al</i> ⁴³	2001	Delhi	Community based study in urban resettlement colony	Unmarried 354 girls and 467 boys aged 15-19 yr	Interview technique	15 per cent males and 6 per cent females reported having premarital sex

FSW, female sex worker

cent of the school dropouts and 3 per cent among the school going adolescents aged 13 to 19 yr and 18.4 per cent among the 9th standard students using Beck's depression Inventory^{52,54}. Promoting mental health and responding to problems on a continuous basis requires a range of adolescent-friendly health care and counselling services in communities⁵⁷.

Stress

Stress is a consequence of or a general response to an action or situation arising from an interaction of the person with his environment and places special physical or psychological demands, or both, on a person. The physical or psychological demands from the environment that cause stress, commonly known as stressors and the individual reaction to them take various forms and depends on several intrinsic and/or extrinsic factors. Significant difficulties have been experienced in quantifying and qualifying stress. Some studies have tried to quantify the stress levels among young people, while others have given a mean stress score (influenced by methods of measuring stress)^{58,59}. Sahoo *et al*⁵⁵ using Depression Anxiety Stress Scale (DASS) observed that 20 per cent young adults experienced stress. Dabut *et al*⁶⁰ using life stress scale found that among adolescent girls studying in 12th standard from Hisar and Hyderabad, 47.5 and 72.5 per cent, were in the moderate category of family stress; financial stress was reported by 60 and 50 per cent and, 90 and 85 per cent had moderate level of social stress, respectively. Sharma & Sidhu in a study, among adolescents aged

16-19 yr using self-made questionnaire based on Bisht Battery of Stress found that 90.6 per cent adolescents had academic stress⁶¹.

Suicide

According to the World Health Organization (WHO) estimates about one million people commit suicide each year⁶². In India, nearly 1,36,000 persons voluntarily ended their lives in a suicidal act as per official reports in 2011⁶³. The official report indicates that age specific suicide rate among 15-29 yr is on the rise increasing from 3.73 to 3.96 per 1,00,000 population per year from 2002 to 2011⁶³ (Fig. 1). About 40 per cent of suicides in India are committed by persons below the age of 30 yr⁶⁴. The Million Death Study using RHIME (Representative, Re-sampled, Routine Household Interview of Mortality with Medical Evaluation) method revealed the annual mortality rates to be 25.5 and 24.9 per 1,00,000 population among males and females aged 15-29 yr⁶⁵, respectively. Other studies have shown incidence among young individuals to vary from 100.1 to 72.2 per 1,00,000 population⁶⁶. Study from Bangalore showed that of the 5115 attempted suicide covering all age groups, 2.1, 8.4 and 28.6 per cent individuals were in the age group 10-15, 16-20 and 21-25 yr, respectively; and among 912 completed suicides, 2.2, 16.2 and 21.6 per cent were in the age group 10-15, 16-20 and 21-25 years, respectively⁶⁷. The suicide rates among young females were high (152 per 1,00,000) compared to suicide rates among young men being 69 per 1,00,000 as reported

Table IV. Common mental disorders among young Indians

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Sahoo <i>et al</i> ⁵⁵	2010	Ranchi city, Jharkhand	Cross-sectional study in urban area	500 young adults students selected by stratified sampling method	DASS to assess symptoms on dimensional basis and using Mini International Neuropsychiatric Interview to diagnose on categorical basis	Depressive symptoms were present in 18.5 per cent of the young adult student population, anxiety in 24.4 per cent, and stress in 20 per cent. Clinical depression was present in 12.1 per cent and generalized anxiety disorder in 19.0 per cent of young population
Deb <i>et al</i> ⁵⁶	2010	Kolkata city, West Bengal	School based study in urban area	460 adolescents aged 13-17 yr (220 boys and 240 girls) selected by multi-stage sampling technique	Self-reported semi-structured questionnaire and a standardized psychological test, the STAI	20.1 per cent of boys and 17.9 per cent of girls were suffering from high anxiety
Bansal <i>et al</i> ⁵⁴	2009	Pune, Maharashtra	Urban school based cross-sectional study	125 students studying in 9 th Standard	GHQ-12 and BDI psychological instruments were used for case detection	18.4 per cent of school-going adolescents were found to be depressed and 15.2 per cent were distressed
Malhotra <i>et al</i> ⁵¹	2009	Chandigarh	Prospective study	727 children aged 10-17 yr	PIS and SDQ instrument	Incidence rate of psychiatric disorder was 0.18 per cent /yr
Pillai <i>et al</i> ⁵⁰	2008	Goa	Population-based study in urban and rural area	2048 adolescents aged 12-16 yr	DAWBA tool was used for the diagnosis of a mental disorder	1.8 per cent adolescents aged 12-16 yr had DSM-IV disorders; 1.0 per cent had anxiety disorders, 0.5 per cent had depressive disorder, 0.4 per cent had behavioural disorder and 0.2 per cent had attention-deficit hyperactivity disorder
Ahmad <i>et al</i> ⁵³	2007	Aligarh, Uttar Pradesh	School based cross-sectional study in urban and rural area	410 male adolescents aged 10-19 yr (205 from the rural schools and 205 from the urban schools) selected by PPS	The Y-PSC was used for screening of psychosocial impairment	Prevalence of overall psychosocial problems among the males aged 10-19 yr was 17.9 per cent (17.4% had educational difficulties, 9.2 % had conduct disorders, 3.1 % had depression and 3.8 % had anxiety)

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Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Srinath <i>et al</i> ⁴⁸	2005	Bangalore, Karnataka	Population based study in urban, urban slum and rural area	2064 children aged 0-16 yr	DISC-P, PIS and the FTN questionnaire were used for children aged 6-16 yr. Children between 12-16 yr were also assessed using the DISC-C, Vineland Social Maturity Scale, Binet-Kamat Test, SLD battery and C-GAS	Prevalence rates of psychiatric morbidity among children aged 0-16 and 4-16 yr were 12.5 per cent and 12.0 per cent respectively (depression 0.1%, conduct disorder 0.2%, social anxiety and panic disorder 0.1%, each, among 4-16 yr)
Nair <i>et al</i> ⁵²	2004	Thiruvananthapuram, Kerala	Community based study	899 school/college students and school dropouts aged 13 to 19 yr	BDI was used as a mood measuring instrument	11.2 per cent of school dropouts and 3 per cent of school going young people had severe and extreme grades of depression
Anita <i>et al</i> ⁴⁹	2003	Rohtak, Haryana	Community based study in urban and rural area	800 children aged 6-14 yr	Screening for psychiatric symptoms using CPMS and diagnostic assessment using DISC	16.5 per cent of children aged 6-14 yr had psychiatric symptoms, 4.5 per cent had conduct disorder, followed by 3.25 per cent children with mental retardation, 0.37 per cent depression, 1.87 per cent psychotic symptoms and 2.87 per cent with anxiety

DASS, Depression, Anxiety and Stress Scale; STAI, State-Trait Anxiety Inventory; GHQ-12, General Health Questionnaire-12; BDI, Beck's Depression Inventory; PIS, Parent Interview Schedule; SDQ, Strengths and Difficulties Questionnaire; DABWA, Development and Well-Being Assessment; DSM, Diagnostic and Statistical Manual of Mental Disorders; PPS, Proportionate Probability Sampling; Y-PSC, Youth report of Paediatric Symptom Checklist; DISC-P, Diagnostic interview schedule for children-parent informant; PIS, Parent interview schedule; FTN, Felt treatment needs; DISC-C, Diagnostic interview schedule for children-child informant; SLD, Specific learning disability; C-GAS, Children's global assessment scale; CPMS, Childhood Psychopathology Measurement Schedule

by Aaron *et al*⁶⁶ with similar observations by other authors^{65,68}. Soman *et al*⁶⁹ found an age specific suicide incidence rates among males and females aged 15-24 yr to be 5.1 and 8.1 per 1,00,000 population per year⁶⁹. Suicidal ideas and attempts were also found to be high in Chandigarh⁷⁰ and South Delhi⁷¹ with nearly 6 per cent of individuals aged 11-17 yr and 15.8 per cent adolescents aged 14 to 19 yr reporting suicidal ideas, while 0.4 per cent students aged 11-17 yr and 5.1 per cent students aged 14 to 19 yr reported suicidal attempts.

Tobacco use

The vast majority of tobacco users worldwide begin the use of tobacco during adolescence. Currently, more

than 150 million adolescents use tobacco, and this number is increasing globally⁵⁷. NFHS-3 revealed that 40 per cent of males and 5 per cent of females aged 15 to 24 yr consumed tobacco nationwide²¹. Systematic review of 15 studies across India aged 13-15 yr showed a median prevalence of tobacco use (ever users) to be 18.2 per cent; 14 per cent among males and 6.3 per cent among females⁷². Global Youth Tobacco Survey (GYTS) 2006 and 2009 across India covering 13 to 15 yr old adolescents in 180 schools highlighted an increase in the current users of any form of tobacco from 13.7 to 14.6 per cent and current users of cigarette from 3.8 to 4.4 per cent from 2006 to 2009⁷³. A study from Karnataka showed 4.9 per cent point prevalence and 5.1 per cent life-time prevalence of tobacco use

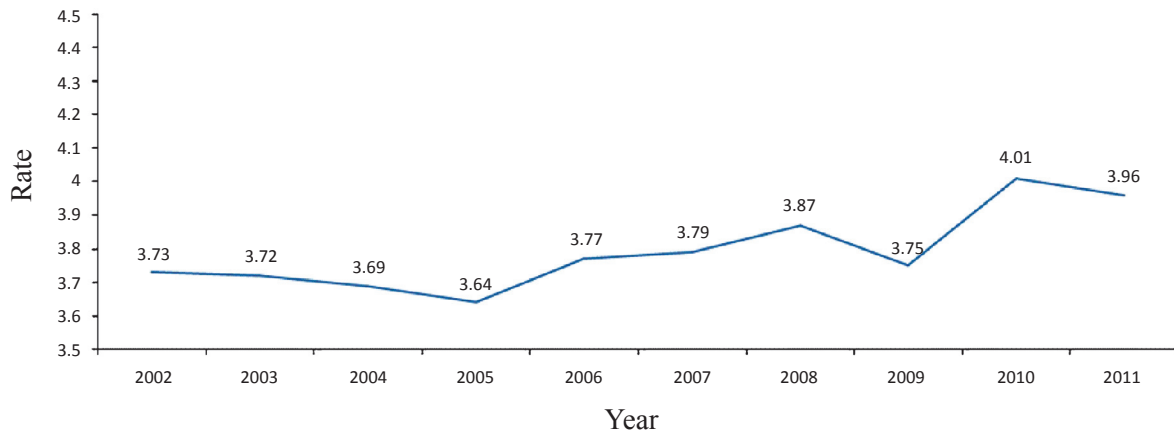


Fig. 1. Completed suicide among 15-29 yr per 100,000 population from 2002 to 2011 (rate/1,00,000 population).
Source: Ref. 63.

among adolescents aged 13-15 yr⁷⁴, while a study from Noida city indicated that 11.2 per cent of adolescents aged 11 to 19 yr were users of any kind of tobacco⁷⁵. Other studies have shown 9.8 to 20.3 per cent life time prevalence of any tobacco products among adolescents^{76,77}. Gender variations for usage of any kind of tobacco varied from 2.9 to 8.5 per cent in boys and 1.5 to 9.8 per cent in girls⁷⁸. The study in Noida city also found that 8.8 per cent of adolescents aged 11 to 19 yr were 'ever smokers' (including current smokers), 4.6 per cent were 'ever tobacco chewers (including current chewers)', 3.7 per cent were 'exclusive smokers' and 2.5 per cent were 'exclusive tobacco chewers'⁷⁵. Data from several studies (Table V) clearly point to the fact that tobacco addiction is emerging as a big threat among young Indians.

Harmful alcohol use

Harmful drinking among young people is an increasing concern in many countries and is linked to nearly 60 health conditions. It increases risky behaviours and is linked to injuries and violence resulting in premature deaths⁵⁷. A national review on harmful effects of alcohol reported greater social acceptability of drinking, increasing consumption in rural and transitional areas, younger age of initiating drinking, and phenomenal socio-economic and health impact, more so among young people⁸¹. Data from the National Household Survey (NHS) by United Nations Office on Drugs and Crime (UNODC), 2002 covering urban and rural areas of 24 States of India revealed a prevalence of 21.4 per cent of alcohol use among men aged 12 to 18 yr⁸². The World Health Survey - India reported that among individuals aged 18 to 24 yr, 3.9 per cent were infrequent heavy drinkers and 0.6 per

cent were frequent heavy drinkers⁸³. The NFHS-3 survey showed that 1 per cent women and 11 per cent men aged 15-19 yr and 1.4 per cent women and 28.8 per cent men aged 20-24 yr consumed alcohol²¹. Other population based studies have shown the prevalence of alcohol consumption varying from 1.3 to 15.6 per cent across studies⁸⁴⁻⁸⁷ with a high consumption among males (12.6 to 20.7%)^{88,89} and more in urban (5.2%) as compared to rural (7.3%) areas⁹⁰ (Table VI).

Other substance use disorders

Substance abuse apart from tobacco and alcohol is one of the major emerging problems among the young population and needs to be tackled effectively. The National Household Survey by UNODC showed that 3.0 per cent of males consumed cannabis and 0.1 per cent opiates⁸² with common substances used being alcohol, tobacco, cannabis, cocaine and heroin^{84,86,88-93}. Studies have shown that non tobacco substance abuse is common, nearly 30 per cent, among street children⁹² with 57.4 per cent of the male street children aged 6 to 16 years having indulged before coming to the observation home⁸⁸. Around 43 per cent adolescents indulge in substances abuse⁹³ with 58.7 per cent of the students having used one or more substances at least once in life, while 31.3 per cent regularly use one or more substances⁹⁴. Chaturvedi *et al* reported that among 10-29 yr old individuals, apart from tobacco and alcohol use, 2.2 per cent of men and 0.3 per cent of women were opium users⁸⁴. The use of prescription drugs (benzodiazepines and opioids) has also been a matter of great concern with its overuse being 16.2 per cent⁹¹. Data on prevalence of injecting drug users available in India, showed that 5.6 and 14.4 per cent of the males in the age group of 20-24 yr and 25-29 yr, respectively

Table V. Prevalence of tobacco use in young people

Author	Year	Place	Nature of Study	Sample	Tools or instruments used	Remarks
National and regional level surveys						
Gajalakshmi <i>et al</i> ³	2010	Nationally representative schools in India	School-based cross sectional survey	11768 students aged 13-15 yr in 2003 and 12,086 students in 2006	Self-administered questionnaire	Prevalence of current usage of any form of tobacco among 13-15 yr old students reduced from 14.6 to 13.7 per cent ; 4.4 per cent of students currently smoked cigarettes in 2003 as compared to 3.8 per cent in 2006
Pal <i>et al</i> ²	2009	Studies in India	Systematic review of 15 studies	40062 students aged 13-15 yr	Pre-tested self-administered questionnaire	The median prevalence of ever users of tobacco among students aged 13-15 yr was 18.2 per cent; 14 per cent among males and 6.3 per cent among females
Parasuraman <i>et al</i> ¹	2009	All India	National level study	47,590 women and 24,997 men aged 15-24 yr	Structured questionnaire	40 per cent of men and 5 per cent of women aged 15 to 24 yr consume tobacco nationwide and in Karnataka 27 per cent men consume tobacco
Gururaj <i>et al</i> ⁴	2007	12 districts of Karnataka	Cross sectional survey in urban, transitional and rural areas	4110 adolescents aged 13-15 yr selected using three stage cluster sampling	Study specific questionnaire	Point prevalence of tobacco use was 4.9 per cent and life-time prevalence was 5.1 per cent among adolescents aged 13-15 yr
Select studies						
Narain <i>et al</i> ⁵	2011	Noida city	School based survey in urban area	4786 students aged 11-19 yrs	Self-administered questionnaire	Prevalence of any kind of tobacco use among 11 to 19 yr old students was 11.2 per cent, 8.8 per cent were ever smokers (including current smokers), 4.6 per cent were ever tobacco chewers (including current chewers), 3.7 per cent were 'exclusive smokers' and 2.5 per cent were 'exclusive tobacco chewers'

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Dhavan <i>et al</i> ⁷⁷	2009	Delhi and Chennai (Project MYTRI)	Longitudinal school based study in urban area	3404 (1837 students in the 6 th grade cohort and 1567 students in the 8 th grade cohort) followed for 3 yr	Self administered surveys	10.5 per cent of students in 2004, 15.4 per cent in 2005 and 20.3 per cent in 2006 reported lifetime use of any tobacco products
Mathur <i>et al</i> ⁷⁹	2008	Delhi and Chennai	School based cross sectional survey in urban area	11,642 students from 6 th to 8 th grade	Study specific questionnaire	18.9 per cent for government school students and 12.2 per cent for private school students have ever-used any of the tobacco products
Singh <i>et al</i> ⁷⁶	2007	Delhi	Cross-sectional study in urban area	3,422 children aged 10-18 yr selected by population proportionate to size and simple random sampling	Pretested structured questionnaire	9.8 per cent of children had at least once experimented with any form of tobacco in their lifetime and 5.4 per cent (boys: 4.6%, girls: 0.8%) of children were "current users" of tobacco products
Reddy <i>et al</i> ⁸⁰	2006	Delhi and Chennai	School based cross sectional study in urban area	11,642 sixth and eighth grades students	Study specific questionnaire	24.8 and 6.7 per cent of sixth-grade students and 9.3 and 2.9 per cent of eighth-grade students had ever used tobacco and were current tobacco users, respectively
Jindal <i>et al</i> ⁷⁸	2005	Chandigarh and Punjab	School-based cross sectional survey	9319 students aged 13-15 yr selected using two-stage cluster sample	85 item questionnaire	The prevalence of ever-use of tobacco varied between 2.9 to 8.5 per cent in boys and 1.5 to 9.8 per cent in girls in Chandigarh and Punjab, respectively.

NFHS, National Family Health Survey; MYTRI, Mobilizing Youth for Tobacco-Related Initiatives in India

were injecting drug users⁹⁵. The data from the National Health Survey suggested that about 0.1 per cent of the male population (12-60 yr) reported ever injecting any illicit drug. Injecting drug use was reported more often from the NE region of the country⁸².

Non-communicable diseases (NCDs)

NCDs include a number of conditions that are behaviour linked and lifestyle related in nature. Indian population, especially young people, is passing through

a nutritional transition and is expected to witness higher prevalence of adult non-communicable diseases such as hypertension, diabetes and chronic lung diseases in the coming years.

At the Indian level, a few studies have shown hypertension among the young people to vary from 2.4 to 5.9 per cent comparable to global level (4.5%)⁹⁶⁻⁹⁹. In another Indian study, hypertension (first instance) was seen in 10.10 per cent of normal weight, 17.34

Table VI. Alcohol use prevalence and patterns among young adults

Author	Year of publication	Place	Nature of study	Sample	Tools or instruments used	Remarks
National level surveys						
Parasuraman <i>et al</i> ²¹	2009	All India	National level study	47,590 women and 24,997 men aged 15-24 yr	Structured questionnaire	1 per cent women and 11 per cent men aged 15-19 yr and 1.4 per cent women and 28.8 per cent men aged 20-24 yr consumed alcohol
IIPS and WHO ⁸³	2006	Assam, Karnataka, Maharashtra, Rajasthan, UP and WB	Population based survey	9994 individuals in 18-24 yr	Study specific questionnaire	3.9 per cent individuals aged 18 to 24 yr were infrequent heavy drinkers and 0.6 per cent were frequent heavy drinkers
UNODC ⁸²	2002	24 States of India (excluding J&K)	National household survey in rural and urban area	8,587 males aged 12-18 yr were selected by systematic multi-stage stratified random sampling	Study specific questionnaire (drug dependence ICD-10)	21.4 per cent male adolescents aged 12 to 18 yr were alcohol users
Select studies						
Kangule <i>et al</i> ⁸⁹	2011	Vasind, Andhra Pradesh	Community based cross-sectional study in rural areas	171 male tribal youths aged 15-24 yr selected by simple random sampling	Pre-designed and semi-structured proforma	20.7 per cent of males aged 15-24 yr were using alcohol alone; 22.2 per cent were using alcohol and tobacco together
Ningombam <i>et al</i> ⁸⁶	2011	Imphal, Manipur	School based cross-sectional survey in urban areas	1037 children aged 15-19 yr	Self-administered questionnaire	15.6 per cent of adolescents aged 15-19 yr had ever used alcohol
Girish <i>et al</i> ⁸⁵	2010	Bangalore district, Karnataka	Cross-sectional study in urban, rural and slum areas	28,507 individuals aged 16 to 60 yr selected by simple random sampling	Pre-tested semi structured questionnaire	10 per cent of alcohol users were adolescents and youth aged 16-25 yr of age
Tsering <i>et al</i> ⁹⁰	2010	West Bengal	School based cross-sectional study in urban and rural areas	416 high school students studying in 8 th , 9 th and 10 th standard selected by multistage random sampling	Pretested close-ended anonymous self-administered questionnaire	5.2 per cent urban students and 7.3 per cent rural students were consuming alcohol

Contd...

Author	Year of publication	Place	Nature of study	Sample	Tools or instruments used	Remarks
Rai <i>et al</i> ⁹¹	2008	Delhi	Cross-sectional survey in urban area	3900 medical students aged 17-32 yr	Study specific questionnaire	32.1 and 9.7 per cent medical students aged 17 to 32 yr had a lifetime and past month usage of alcohol, respectively
Medhi <i>et al</i> ⁸⁷	2006	Dibrugarh, Assam	Population based study in urban and rural areas	2,264 individuals aged 15 yr and above selected by multistage sampling design	Predesigned and pretested questionnaire	32.2 per cent of the individuals aged 15 yr and above consumed alcohol
Pagare <i>et al</i> ⁸⁸	2004	Delhi	Observational study in urban area	115 male street children aged 6 to 16 yr	Semi-structured questionnaire	12.6 per cent male street children aged 6 to 16 yr consumed alcohol
Chaturvedi <i>et al</i> ⁸⁴	2004	Changlang, Arunachal Pradesh	Community based cross-sectional study in rural area	1538 males and 1444 females in the age group 10-29 yr were selected using simple random sampling	Study specific questionnaire	11.2 per cent of the individuals aged 10 to 29 yr were alcohol users

IIPS, International Institute for Population Sciences; WHO, World Health Organization; UNODC, United Nations Office on Drugs and Crime; UP, Uttar Pradesh; WB, West Bengal; J&K, Jammu and Kashmir; ICD-10, International Classification of Diseases-10

per cent of overweight and 18.32 per cent of obese children¹⁰⁰. The prevalence of youth-onset type 2 diabetes is increasing worldwide in parallel with the obesity epidemic. Study from Chennai reported a temporal shift in the age at diagnosis of type 2 diabetes to a younger group with a prevalence of 3.7 per cent among 20-29 yr¹⁰¹. A study from Delhi also reported a high prevalence of insulin resistance in post pubertal children which was associated with excess body fat and abdominal adiposity¹⁰². Chronic lung diseases are also increasing among the young and globally, approximately one in ten young people have asthma⁹⁹. A study among the school going children (5-15 yr) using modified ISAAC questionnaire in Jaipur city showed 7.59 per cent children to have asthma (in last 12 months)¹⁰³ and 4.9 per cent in another study in South India¹⁰⁴.

Road traffic injuries (RTIs)

Road traffic injuries (1,85,000 deaths; 29 per cent of all unintentional injury deaths) are the leading cause of unintentional injury mortality in India¹⁰⁵. National

Crime Records Bureau (NCRB) report of 2011 of India showed that 31.3 per cent of the road traffic deaths were seen among 15 to 29 years individuals⁶³ (Fig. 2). Transport Research Wing of the Ministry of Road Transport & Highways (MORTH) revealed that of the total road accident casualties, 30.3 per cent were in the age group of 15-24 yr¹⁰⁶. The Registrar General of India (in 2001-03) showed that motor vehicle injuries contributed to 3.7 per cent of deaths in 5-14 years and 6.9 per cent deaths in 15-24 years (1.7 and 12.4% in females and males, respectively)¹⁰⁷. A survey of 20,000 households covering 96,414 individuals in Bangalore found that deaths due to RTIs among children aged 6-15 yr ranged from 5 to 20 per cent and serious injuries from 10-21 per cent and over half of all killed and seriously injured in RTIs occurred to the young adults aged 16-45 yr, more so among those aged 16-30 yr¹⁰⁸. The Bangalore Injury Surveillance Project has reported that 38.9 and 36 per cent in 15-29 yr age group had fatal RTI in urban and rural areas, respectively, while 36 per cent had non-fatal RTI in both areas among the same age group¹⁰⁹. Sharma *et al*

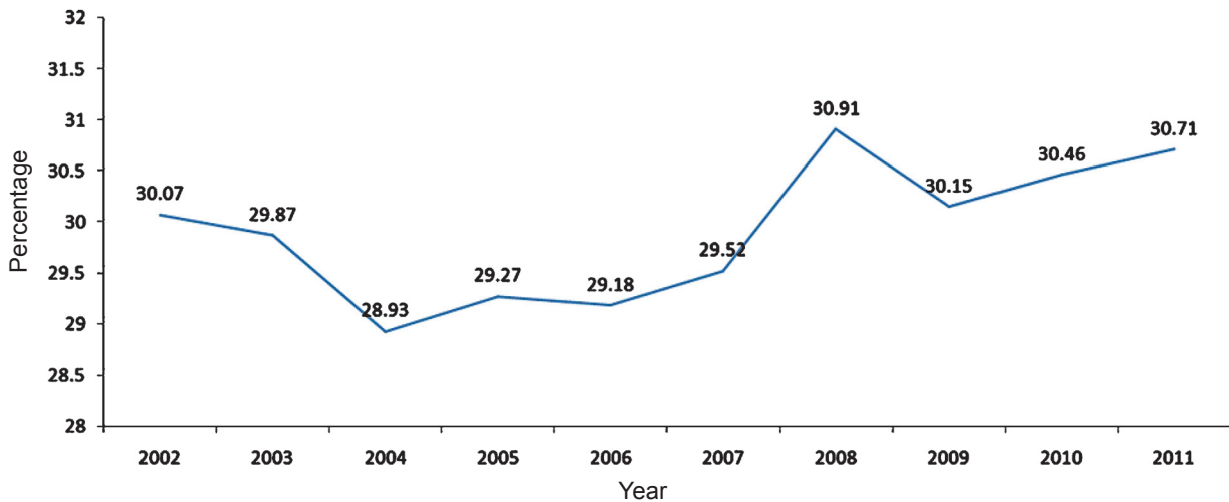


Fig. 2. Trend of road traffic injuries among 15-29 yr old individuals from 2002 to 2011 in India.

Source: Ref. 63.

from Chandigarh¹¹⁰ reported that RTI constituted 11 per cent of the total unnatural deaths among 16-20 yr age group. The incidence of non fatal RTIs among children examined in a few studies revealed that the age-sex adjusted incidence rate among 5-14 yr age group was 18.5 per cent and the age-sex-adjusted annual rate of RTI requiring recovery period of >7 days was 5.8 per cent¹¹¹. The same authors reported an annual non-fatal RTI incidence rate adjusted for sex among 10-14, 15-19 and 20-29 yr of 23.5, 30.1 and 20.9 per 100 persons per year, respectively¹¹².

Violence

The WHO defines violence as “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal development or deprivation”¹¹³. Interpersonal violence among youth ranging from minor acts of bullying to severe forms of homicide contribute greatly to the burden of premature death, injury and disability; harming not just the affected but also their families, friends and communities. An average of 565 adolescents and young adults between the ages of 10 and 29 yr die each day as a result of interpersonal violence across the world¹¹⁴. NFHS-3 from India revealed that 27 per cent married young females experienced physical, sexual, or emotional violence by their spouse and 7 per cent of all females and 11 per cent of married females experienced sexual violence²¹. Studies from India (Table VII) reported that 19 to 42.8 per cent of adolescent females had

experienced domestic violence^{115,116} and 25.3 and 32.2 per cent of young married women experienced physical and sexual violence within marriage, respectively¹¹⁷. Deb *et al*¹¹⁸ in a sample of students aged 14 to 19 yr showed that 20.9, 21.9 and 18.1 per cent of the children experienced psychological, physical and sexual violence, respectively. Sharma *et al*¹²¹ showed that 13.5 per cent adolescents aged 14 to 19 yr had threatened or injured someone with a weapon in the past 12 months; 49.1 per cent boys and 39.6 per cent girls reported being involved in a physical fight in the past 12 months. Both the genders were commonly involved in inter-personal violence as shown by Baruah and Baruah¹¹⁹ where 42 per cent males and 49.6 per cent female aged 15-29 yr had indulged in interpersonal violence and 48 per cent males and 60.4 per cent females had indulged in self inflicted violence.

Multiple health behaviours and co-morbid conditions

It is important to highlight that some behaviours and conditions listed above and several others not covered here do not occur in isolation but are often seen as coexisting behaviours and as co-morbid conditions. It is widely acknowledged that tobacco and alcohol use coexists, while binge drinking is closely linked to road crashes and violence. Alcohol is linked to more than 60 health problems and a variety of social issues ranging from domestic violence to diabetes. Similarly, depression and obesity are closely linked to a number of NCDs and depression in particular with suicides. The Health Behaviour Study in Bangalore covering nearly 10,000 individuals aged 18 to 45 yr from urban, rural,

Table VII. Prevalence and pattern of violence among young people

Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
National level surveys						
Acharya <i>et al</i> ¹¹⁷	2009 (unpublished paper)	Bihar, Jharkhand, Rajasthan, Maharashtra, Andhra Pradesh and Tamil Nadu	Population based study of rural and urban settings	13,912 married females aged 15-24 yr selected by systematic, multi-stage sampling design	Pretested structured questionnaire	25.3 and 32.2 per cent of married young women experienced physical and sexual violence within marriage, respectively
Parasuraman <i>et al</i> ²¹	2009	All India	National level study	47,590 women aged 15-24 yr	Structured questionnaire	27 per cent married female youth experienced physical, sexual, or emotional violence by their husband; 7 per cent of all female youth and 11 per cent of married female youth experienced sexual violence
Ackerson <i>et al</i> ¹¹⁶	2008	All India	National level cross-sectional study	4,677 females aged 15-19 yr	Structured questionnaire	19 per cent of females aged 15 to 19 yr reported domestic violence
Select studies						
Sarkar ¹¹⁵	2010	Hooghly, West Bengal	Community-based cross-sectional study in rural area	141 females aged 10 yrs and above	Pre-designed and pre-tested questionnaire	42.8 per cent of 10-19 yr old females had experienced domestic violence
Deb <i>et al</i> ¹¹⁸	2010	Agartala, Tripura	School based cross-sectional study in urban area	320 students aged 14 to 19 yr selected by multi stage random sampling	Semi-structured questionnaire	20.9, 21.9 and 18.1 per cent of the children experienced psychological, physical and sexual violence, respectively
Sharma <i>et al</i> ¹²¹	2008	South Delhi	School based study in urban area	550 adolescents aged 14-19 yr selected by two-stage cluster sampling	Pretested, semi-open-ended and self-administered questionnaire	13.5 per cent adolescents aged 14 to 19 yr had threatened or injured someone with a weapon in past 12 months; 49.1 per cent boys and 39.6 per cent girls reported being involved in a physical fight in past 12 months

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Author	Year	Place	Nature of study	Sample	Tools or instruments used	Remarks
Baruah <i>et al</i> ¹¹⁹	2007	Dibrugarh, Assam	Hospital based study	2090 victims of violence of all ages with 15-29 included	Pretested proforma	42 per cent males and 49.6 per cent female aged 15-29 yr had indulged in interpersonal violence cases and 48 per cent males and 60.4 per cent females had indulged in self inflicted violence
Munni <i>et al</i> ¹²⁰	2006	Chandigarh	School based cross-sectional survey	1500 students of 8 th to 12 th standard	Anonymous self-reporting questionnaire	27 per cent students were victims and 13 per cent were perpetrators of violence

slum and transitional areas reported that 30 per cent had more than five behaviours/conditions existing in the same individual¹²². Evidence from National Household Survey showed that over 26 per cent adult men found to be alcohol users also had higher prevalence of STIs¹²³. Thus, it becomes apparent that while addressing one problem becomes critical, addressing multiple issues in an integrated manner becomes a need in health policies and programmes.

Responding to the challenge

The importance of investing in youth has been recognized in India's Constitution. One of the Directive Principles of State Policy, states that "...it is imperative that children are given opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity and that childhood and youth are protected against exploitation and against moral and material abandonment"¹²⁴. Policies and programmes focussing on education [National policy on education (1986 modified in 1992)¹²⁵, *Sarva Shiksha Abhiyan*¹²⁶, *Rashtriya Madhyamik Shiksha Abhiyan*]¹²⁷, welfare [National Policy for the Empowerment of Women (2001)¹²⁸; *Balika Samridhi Yojana*, 1997¹²⁹; National Policy on Child Labour, 1987]¹³⁰, employment (*Swarnjayanti Gram Swarozgar Yojana*)¹³¹ and others (National Policy for Persons with Disabilities)¹³² have included young people and highlight health as one of the components. In many of these, the detailed implementation – monitoring and evaluation plan are not elaborated in detail and their impact needs to be examined in detail.

Some of the health policies and programmes have also given a place for youth; a few have a specific youth health focus while others make an indirect mention. The Implementation Guide for State and District Programme Managers under National Rural Health Mission notes that "friendly services are to be made available for all adolescents, married and unmarried, girls and boys"¹³³. Some of these are also focussed on mothers and children. The National Population Policy 2000, the National Health Policy 2002 and the National AIDS Prevention and Control Policy 2002 have all articulated India's commitment to promoting and protecting the health and rights of adolescents and youth, including those relating to mental, and sexual and reproductive health¹³⁴. The Recent National Programme on Prevention and Control of Cancer, Cardiovascular Diseases, Diabetes and Stroke also has a focus on health promotion and early recognition of health impacting behaviours.

The exclusive National Youth Policy of 2003 driven by the Ministry of Youth Affairs & Sports has attempted to focus on special requirements of youth, covering 13 to 35 years, further subdivided into 13-19 years and 20-35 years. The adapted strategies include youth empowerment, gender justice, inter-sectoral approach, and an information and research network. The priority target groups under the policy include rural and tribal youth, out-of-school youth, adolescents particularly females, youth with disabilities and adolescents under special circumstances like victims of trafficking; orphans and street children¹³⁵. A number

of State-specific policies and programmes also exist that highlight State strategies for meeting the needs of youth¹³⁴. It is also apparent that the impact of these policies on health of youth has not been evaluated for its coverage, comprehensiveness, efficacy and effectiveness.

Conclusion

The present review, though limited in nature highlights that a significant proportion of youth has health impacting behaviours and conditions that affect their growth and development, that the problem is on the increase, many are interlinked and coexist, and likely to increase in the coming years. Some of the major health impacting behaviours and problems among the young people include undernutrition and overnutrition, common mental disorders including stress and anxiety, suicidal tendencies and increased suicidal death rates, increased consumption of tobacco, alcohol and other substance use, NCDs, high risk sexual behaviours including STIs and importantly, injuries mainly RTIs and violence. Many of these problems are closely linked to ongoing nutrition and epidemiological transition and are behaviour related with a life course perspective. There is a strong need for public health community to identify, prepare, integrate and implement activities that help to promote health and healthy lifestyles of young people and establish mechanisms for delivery of population-based interventions along with measuring its impact. There is a need to generate good quality and robust population data that can drive policies and programmes. Strategic investments in health, nutrition, education, employment and welfare are critical for healthy growth of young people and these programmes need to be monitored and evaluated for their efficacy and effectiveness using public health approaches.

References

1. Adolescent health and development. WHO Regional Office for South-East Asia. Available from: http://www.searo.who.int/entity/child_adolescent/topics/adolescent_health/en/index.html, accessed on January 8, 2013.
2. World Health Organization. Chapter 3: Health across the life span. In: The World Health Report 1998. Life in the 21st Century. A vision for all. Report of the Director-General. Geneva: World Health Organization; 1998 p. 66-111. Available from: http://www.who.int/whr/1998/en/whr98_en.pdf, accessed on January 8, 2013.
3. Stang J, Story M. Chapter 1. Adolescent growth and development. In: Guidelines for adolescent nutrition services. Minneapolis, MN Center for Leadership, Education and Training in Maternal and Child Nutrition, Division of Epidemiology and Community Health, School of Public Health, University of Minnesota; 2005. Available from: http://www.epi.umn.edu/let/pubs/img/adol_ch1.pdf, accessed on June 20, 2012.
4. Jekielek S, Brown B. The Transition to Adulthood: Characteristics of Young Adults Ages 18 to 24 in America. Kids count/PRB/Child Trends Report on Census 2000. The Annie Casey Foundation, Population reference Bureau, and Child trends, Washington DC; 2005 May. Available from: <http://www.prb.org/pdf05/transitiontoadulthood.pdf>, accessed on June 20, 2012.
5. Planning Commission. Report of the Steering committee on Youth Affairs and Sports for the Eleventh Five Year Plan (2007-12). New Delhi; 2008 September p. 41. Available from: http://planningcommission.nic.in/aboutus/committee/strgrp11/str_yas.pdf, accessed on June 18, 2012.
6. Central Bureau of Health Intelligence. Demographic indicators. In: National Health Profile 2011. Prabhat Publicity, New Delhi; 2011. Available from: <http://www.cbhidghs.nic.in/writereaddata/mainlinkFile/01%20Cover%20page%202011.pdf>, accessed on June 18, 2012.
7. Dev SM, Venkatanarayana M. Youth employment and unemployment in India. Indira Gandhi Institute of Development Research, Mumbai; 2011. Available from: <http://www.igidr.ac.in/pdf/publication/WP-2011-009.pdf>, accessed on December 28, 2012.
8. Young people: health risks and solutions. Fact sheet no. 345. World Health Organization; 2011. Available from: <http://www.who.int/mediacentre/factsheets/fs345/en/index.html>, accessed on June 8, 2013.
9. Adolescent Health Services: Missing Opportunities. Available from: http://books.nap.edu/openbook.php?record_id=12063&page=1, accessed on January 8, 2013.
10. Collins PY, Insel TR, Chockalingam A, Daar A, Maddox YT. Grand challenges in global mental health: integration in research, policy, and practice. *PLoS Med* 2013; 10 : e1001434.
11. Gururaj G. Injury prevention and care: an important public health agenda for health, survival and safety of children. *Indian J Pediatr* 2013; 80 (Suppl 1) : S100-8.
12. Adolescent Health - Healthy People. Available from: http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=2#Ref_03, accessed on January 9, 2013.
13. Mulye TP, Park MJ, Nelson CD, Adams SH, Irwin CE, Brindis CD. Trends in adolescent and young adult health in the United States. *J Adolesc Health* 2009; 45 : 8-24.
14. World Youth Report 2003: The Global Situation of Young People. New York: Department of Economic and Social Affairs, United Nations; 2004. p. 429. Available from: <http://www.un.org/esa/socdev/unyin/documents/worldyouthreport.pdf>, accessed on January 9, 2013.
15. National Nutrition Monitoring Bureau. Diet & nutritional status of rural population. Hyderabad: National Institute of Nutrition; 2002. p. 158. NNMB Technical Report No.21. Available from: <http://www.nnmbindia.org/NNMBREPORT2001-web.pdf>, accessed on July 12, 2012.
16. National Nutrition Monitoring Bureau. Diet & nutritional status of population and prevalence of hypertension among adults in rural areas. Hyderabad: National Institute of Nutrition; 2006. p. 166. NNMB Technical Report No. 24. Available

- from: <http://www.nmmbindia.org/NNMBReport06Nov20.pdf>, accessed on July 12, 2012.
17. Wasnik V, Rao BS, Rao D. A study of the health status of early adolescent girls residing in social welfare hostels in Vizianagaram district of Andhra Pradesh state, India. *Inter J Collabor Res Intern Med Public Health* [serial on the Internet] 2012. Available from: <http://iomcworld.com/ijcrimph/ijcrimph-v04-n01-07.htm>, accessed on July 18, 2012.
 18. Rao VG, Aggrawal MC, Yadav R, Das SK, Sahare LK, Bondley MK, et al. Intestinal parasitic infections, anaemia and undernutrition among tribal adolescents of Madhya Pradesh. *Indian J Community Med* 2003; 28 : 26-9.
 19. Choudhary S, Mishra CP, Shukla KP. Nutritional status of adolescent girls in rural area of Varanasi. *Indian J Prev Soc Med* 2003; 34 : 53-61.
 20. Haboubi GJ, Shaikh RB. A comparison of the nutritional status of adolescents from selected schools of South India and UAE : a cross-sectional study. *Indian J Community Med* 2009; 34 : 108-11.
 21. Parasuraman S, Kishor S, Singh SK, Vaidehi Y. A profile of youth in India. National Family Health Survey (NFHS-3), India, 2005-06. Mumbai: International Institute for Population Sciences; Calverton, Maryland, USA: ICF Macro; 2009. Available from: http://www.rchiips.org/NFHS/youth_report_for_website_18sep09.pdf, accessed on August 4, 2012.
 22. Maliye C, Deshmukh P, Gupta S, Kaur S, Mehendale A, Garg B. Nutrient intake amongst rural adolescent girls of Wardha. *Indian J Community Med* 2010; 35 : 400-2.
 23. Deshmukh PR, Gupta SS, Bharambe MS, Dongre AR, Maliye C, Kaur S, et al. Nutritional status of adolescents in rural Wardha. *Indian J Pediatr* 2006; 73 : 139-41.
 24. Adolescents in India: A profile. UN Inter Agency Working Group on Population and Development (IAWG-P&D); 2003 p. 90. Available from: <http://web.unfpa.org/focus/india/facetoface/docs/adolescentsprofile.pdf>, accessed on January 10, 2013.
 25. Midha T, Nath B, Kumari R, Rao YK, Pandey U. Childhood obesity in India: a meta-analysis. *Indian J Pediatr* 2012; 79 : 945-8.
 26. Goyal JP, Kumar N, Parmar I, Shah VB, Patel B. Determinants of overweight and obesity in affluent adolescent in Surat city, South Gujarat region, India. *Indian J Community Med* 2011; 36 : 296-300.
 27. Kotian MS, Kumar SG, 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. Aggarwal T, Bhatia R, Singh D, Sobti PC. Prevalence of obesity and overweight in affluent adolescents from Ludhiana, Punjab. *Indian Pediatr* 2008; 45 : 500-2.
 29. Laxmaiah A, Nagalla B, Vijayaraghavan K, Nair M. Factors affecting prevalence of overweight among 12- to 17-year-old urban adolescents in Hyderabad, India. *Obesity* 2007; 15 : 1384-90.
 30. Mehta M, Bhasin SK, Agrawal K, Dwivedi S. Obesity amongst affluent adolescent girls. *Indian J Pediatr* 2007; 74 : 619-22.
 31. Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in Pune. *Indian Pediatr* 2004; 41 : 857-8.
 32. Kumar S, Mahabalaraju DK, Anuroopa MS. Prevalence of obesity and its influencing factor among affluent school children of Davangere city. *Indian J Community Med* 2007; 32 : 15-7.
 33. Cherian AT, Cherian SS, Subbiah S. Prevalence of obesity and overweight in urban school children in Kerala, India. *Indian Pediatr* 2012; 49 : 475-7.
 34. Jeemon P, Prabhakaran D, Mohan V, Thankappan KR, Joshi PP, Ahmed F, SSIP Investigators, et al. Double burden of underweight and overweight among children (10-19 years of age) of employees working in Indian industrial units. *Natl Med J India* 2009; 22 : 172-6.
 35. Srihari G, Eilander A, Muthayya S, Kurpad AV, Seshadri S. Nutritional status of affluent Indian school children: what and how much do we know? *Indian Pediatr* 2007; 44 : 204-13.
 36. Mohan V, Sandeep S, Deepa R, Shah B, Varghese C. Epidemiology of type 2 diabetes: Indian scenario. *Indian J Med Res* 2007; 125 : 217-30.
 37. Shetty PS. Nutrition transition in India. *Public Health Nutr* 2002; 5 : 175-82.
 38. High-Risk Sexual Behavior. EverydayHealth.com. Available from: <http://www.everydayhealth.com/health-center/high-risk-sexual-behavior-info.aspx>, accessed on January 14, 2013.
 39. International Institute for Population Sciences (IIPS) and Macro International, 2007. National Family Health Survey (NFHS-3), 2005-06, India: Key Findings. Mumbai : IIPS. Available from: <http://www.measuredhs.com/pubs/pdf/SR128/SR128.pdf>, accessed on August 17, 2012.
 40. Kumar GA, Dandona R, Kumar SG, Dandona L. Behavioral surveillance of premarital sex among never married young adults in a high HIV prevalence district in India. *AIDS Behav* 2011; 15 : 228-35.
 41. Santhya KG, Ram U, Acharya R, Mohanty S, Jejeebhoy SJ, Singh A, et al. Pre-marital sexual relations among youth in India: findings from the youth in India, situations and needs study. *Proceedings of the XXVI International Union for the Scientific Study of Population Conference* 2009 Sept 27-Oct 2; Marrakech, Morocco.
 42. Alexander M, Garda L, Kanade S, Jejeebhoy S, Ganatra B. Correlates of premarital relationships among unmarried youth in Pune district, Maharashtra, India. *Int Fam Plan Perspect* 2007; 33 : 150-9.
 43. Savithri R, Mehra S, Kole SK, Sakhuja A. Sexual behaviour among adolescents and young people in India : some emerging trends. Working Paper Series No. 3. New Delhi: MAMTA - Health Institute for Mother and Child; 2002.
 44. Sujay R. Premarital sexual behaviour among unmarried college students of Gujarat, India. Health and Population Innovation, Fellowship Programme Working Paper No. 9. New Delhi: Population Council; 2009. p. 51. Available from: http://www.popcouncil.org/pdfs/wp/India_HPIF/009.pdf, accessed on August 17, 2012.
 45. Gaffey MF, Venkatesh S, Dhingra N, Khera A, Kumar R, Arora P, et al. Male use of female sex work in India: A Nationally Representative Behavioural Survey. *PLoS One* 2011; 6 : e22704.

46. Ghule M, Donta B. Correlates of sexual behaviour of rural college youth in Maharashtra, India. *East J Med* 2011; 16 : 122-32.
47. Reddy VM, Chandrashekar CR. Prevalence of mental and behavioural disorders in India: a meta-analysis. *Indian J Psychiatry* 1998; 40 : 149-57.
48. Srinath S, Girimaji SC, Gururaj G, Seshadri S, Subbakrishna DK, Bhola P, *et al.* Epidemiological study of child & adolescent psychiatric disorders in urban & rural areas of Bangalore, India. *Indian J Med Res* 2005; 122 : 67-79.
49. Anita S, Gaur DR, Vohra AK, Subash S, Khurana H. Prevalence of psychiatric morbidity among 6 to 14 years old children. *Indian J Community Med* 2003; 28 : 133-7.
50. Pillai A, Patel V, Cardozo P, Goodman R, Weiss HA, Andrew G. Non-traditional lifestyles and prevalence of mental disorders in adolescents in Goa, India. *Br J Psychiatry* 2008; 192 : 45-51.
51. Malhotra S, Kohli A, Kapoor M, Pradhan B. Incidence of childhood psychiatric disorders in India. *Indian J Psychiatry* 2009; 51 : 101-7.
52. Nair MK, Paul MK, John R. Prevalence of depression among adolescents. *Indian J Pediatr* 2004; 71 : 523-4.
53. Ahmad A, Khalique N, Khan Z, Amir A. Prevalence of psychosocial problems among school going male adolescents. *Indian J Community Med* 2007; 32 : 219.
54. Bansal V, Goyal S, Srivastava K. Study of prevalence of depression in adolescent students of a public school. *Ind Psychiatry J* 2009; 18 : 43-6.
55. Sahoo S, Khess CR. Prevalence of depression, anxiety, and stress among young male adults in India: a dimensional and categorical diagnoses-based study. *J Nerv Ment Dis* 2010; 198 : 901-4.
56. Deb S, Chatterjee P, Walsh KM. Anxiety among high school students in India : comparisons across gender, school type, social strata, and perceptions of quality time with parents [serial on the Internet]. *Aust J Educ Dev Psychol* 2010; 10 : 18-31.
57. World Health Organization. 10 facts on adolescent health. Available from: http://www.who.int/features/factfiles/adolescent_health/facts/en/index4.html, accessed on January 14, 2013.
58. Latha KS, Reddy H. Patterns of stress, coping styles and social supports among adolescents. *J Indian Assoc Child Adolesc Ment Health* 2007; 3 : 5-9.
59. Ghaderi AR, Kumar GV, Kumar S. Depression, anxiety and stress among the Indian and Iranian students. *J Indian Acad Appl Psychol* 2009; 35 : 33-7.
60. Dubat K, Punia S, Goyal R. A study of life stress and coping styles among adolescent girls. *J Soc Sci* 2007; 14 : 191-4.
61. Sharma J, Sidhu R. Sources of stress among students preparing in coaching institutes for admission to professional courses. *J Psychol* 2011; 2 : 21-4.
62. Suicide prevention (SUPRE). World Health Organization. Available from: http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/, accessed on January 15, 2013.
63. Accidental deaths & suicides in India 2011. New Delhi: National Crime Records Bureau, Ministry of Home Affairs; 2012. p. 317. Available from: <http://ncrb.nic.in/CD-ADSI2011/ADSI-2011%20REPORT.pdf>, accessed on November 15, 2012.
64. Vijayakumar L. Suicide & mental disorders - a maze? *Indian J Med Res* 2006; 124 : 371-4.
65. Patel V, Ramasundarahettige C, Vijayakumar L, Thakur JS, Gajalakshmi V, Gururaj G, *et al.* Suicide mortality in India: a nationally representative survey. *Lancet* 2012; 379 : 2343-51.
66. Aaron R, Joseph A, Abraham S, Muliylil J, George K, Prasad J, *et al.* Suicides in young people in rural southern India. *Lancet* 2004; 363 : 1117-8.
67. Gururaj G, Sateesh VL, Rayan AB, Roy AC, Amarnath, Ashok J, *et al.* Bengaluru injury surveillance collaborators group. Bengaluru injury / Road traffic injury surveillance programme: a feasibility study. Bengaluru: National Institute of Mental Health & Neuro Sciences; 2008. Available from: <http://www.nimhans.kar.nic.in/epidemiology/bisp/sr1.pdf>, accessed on January 16, 2013.
68. Prasad J, Abraham VJ, Minz S, Abraham S, Joseph A, Muliylil JP, *et al.* Rates and factors associated with suicide in Kaniyambadi Block, Tamil Nadu, South India, 2000-2002. *Int J Soc Psychiatry* 2006; 52 : 65-71.
69. Soman CR, Safraj S, Kutty VR, Vijayakumar K, Ajayan K. Suicide in South India: a community-based study in Kerala. *Indian J Psychiatry* 2009; 51 : 261-4.
70. Arun P, Chavan BS. Stress and suicidal ideas in adolescent students in Chandigarh. *Indian J Med Sci* 2009; 63 : 281-7.
71. Sharma R, Grover VL, Chaturvedi S. Suicidal behavior amongst adolescent students in south Delhi. *Indian J Psychiatry* 2008; 5 : 30-3.
72. Pal R, Tsering D. Tobacco use in Indian high-school students. *Int J Green Pharm* 2009; 3 : 319-23.
73. Gajalakshmi V, Kanimozhi CV. A survey of 24,000 students aged 13-15 years in India: Global Youth Tobacco Survey 2006 and 2009. *Tob Use Insights* 2010; 3 : 23-31.
74. Gururaj G, Girish N. Tobacco use amongst children in Karnataka. *Indian J Pediatr* 2007; 74 : 1095-8.
75. Narain R, Sardana S, Gupta S, Sehgal A. Age at initiation & prevalence of tobacco use among school children in Noida, India: A cross-sectional questionnaire based survey. *Indian J Med Res* 2011; 133 : 300-7.
76. Singh V, Pal HR, Mehta M, Kapil U. Tobacco consumption and awareness of their health hazards amongst lower income group school children in National capital territory of Delhi. *Indian Pediatr* 2007; 44 : 293-5.
77. Dhavan P, Stigler MH, Perry CL, Arora M, Reddy KS. Patterns of tobacco use and psychosocial risk factors among students in 6th through 10th grades in India: 2004-2006. *Asian Pac J Cancer Prev* 2009; 10 : 807-13.
78. Jindal SK, Aggarwal AN, Gupta D, Kashyap S, Chaudhary D. Prevalence of tobacco use among school going youth in North Indian States. *Indian J Chest Dis Allied Sci* 2005; 47 : 161-6.
79. Mathur C, Stigler MH, Perry CL, Arora M, Reddy KS. Differences in prevalence of tobacco use among Indian urban youth: the role of socioeconomic status. *Nicotine Tob Res* 2008; 10 : 109-16.

80. Reddy KS, Perry CL, Stigler MH, Arora M. Differences in tobacco use among young people in urban India by sex, socioeconomic status, age, and school grade: assessment of baseline survey data. *Lancet* 2006; 367 : 589-94.
81. Gururaj G, Murthy P, Rao GN, Benegal V. Alcohol related harm: Implications for public health and policy in India. Publication No.: 73. Bangalore: National Institute of Mental Health & Neuro Sciences; 2011. p. 160. Available from: http://www.nimhans.kar.nic.in/deaddiction/CAM/Alcohol_report_NIMHANS.pdf, accessed on January 14, 2013.
82. The extent, patterns and trends of drug abuse in India - National Survey. UNODC, Regional Office for South Asia; 2002. Available from: http://www.unodc.org/pdf/india/publications/national_Survey/10_results.pdf, accessed on January 15, 2013.
83. Health System Performance Assessment. World Health Survey, 2003, India. International Institute for Population Sciences (IIPS), Mumbai. World Health Organization (WHO), Geneva and WHO - India-WR Office, New Delhi; 2006. Available from: http://www.who.int/healthinfo/survey/whs_hspa_book.pdf, accessed on January 14, 2013.
84. Chaturvedi HK, Mahanta J. Sociocultural diversity and substance use pattern in Arunachal Pradesh, India. *Drug Alcohol Depend* 2004; 74 : 97-104.
85. Girish N, Kavita R, Gururaj G, Benegal V. Alcohol use and implications for public health: patterns of use in four communities. *Indian J Community Med* 2010; 35 : 238-44.
86. Ningombam S, Hutin Y, Murhekar MV. Prevalence and pattern of substance use among the higher secondary school students of Imphal, Manipur, India. *Natl Med J India* 2011; 24 : 11-5.
87. Medhi GK, Hazarika NC, Mahanta J. Correlates of alcohol consumption and tobacco use among tea industry workers of Assam. *Subst Use Misuse* 2006; 41 : 691-706.
88. Pagare D, Meena GS, Singh MM, Saha R. Risk factors of substance use among street children from Delhi. *Indian Pediatr* 2004; 41 : 221-5.
89. Kangule D, Darbastwar M, Kokiwar P. A cross-sectional study of prevalence of substance use and its determinants among male tribal youths. *Int J Pharm Biomed Sci* 2011; 2 : 61-4.
90. Tsering D, Pal R, Dasgupta A. Licit and illicit substance use by adolescent students in eastern India: prevalence and associated risk factors. *J Neurosci Rural Pract* 2010; 1 : 76-81.
91. Rai D, Gaete J, Girotra S, Pal HR, Araya R. Substance use among medical students: time to reignite the debate? *Natl Med J India* 2008; 21 : 75-8.
92. Bal B, Mitra R, Mallick AH, Chakraborti S, Sarkar K. Nontobacco substance use, sexual abuse, HIV, and sexually transmitted infection among street children in Kolkata, India. *Subst Use Misuse* 2010; 45 : 1668-82.
93. Sarangi L, Acharya HP, Panigrahi OP. Substance abuse among adolescents in urban slums of Sambalpur. *Indian J Community Med* 2008; 33 : 265-7.
94. Juyal R, Bansal R, Kishore S, Negi KS, Chandra R, Semwal J. Substance use among intercollege students in district Dehradun. *Indian J Community Med* 2006; 31 : 252-4.
95. Aceijas C, Friedman SR, Cooper HL, Wiessing L, Stimson GV, Hickman M. Estimates of injecting drug users at the national and local level in developing and transitional countries, and gender and age distribution. *Sex Transm Infect* 2006; 82 (Suppl 3) : iii10-iii17.
96. Narayanappa D, Rajani HS, Mahendrapa KB, Ravikumar VG. Prevalence of prehypertension and hypertension among urban and rural school going children. *Indian Pediatr* 2012; 49 : 755-6.
97. Kumar J, Deshmukh PR, Garg BS. Prevalence and correlates of sustained hypertension in adolescents of Rural Wardha, Central India. *Indian J Pediatr* 2012; 79 : 1206-12.
98. Sharma A, Grover N, Kaushik S, Bhardwaj R, Sankhyan N. Prevalence of hypertension among schoolchildren in Shimla. *Indian Pediatr* 2010; 47 : 873-6.
99. Non-Communicable diseases and adolescents- an opportunity for action. The AstraZeneca. Available from: <http://www.jhsph.edu/research/centers-and-institutes/center-for-adolescent-health/az/noncommunicable.pdf>, accessed on May 20, 2013.
100. Raj M. Essential hypertension in adolescents and children: recent advances in causative mechanisms. *Indian J Endocrinol Metab* 2011; 15 (Suppl 4) : S367-73.
101. Mohan V, Deepa M, Deepa R, Shanthirani CS, Farooq S, Ganesan A, et al. Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban South India-the Chennai Urban Rural Epidemiology Study (CURES-17). *Diabetologia* 2006; 49 : 1175-8.
102. Misra A, Vikram NK, Arya S, Pandey RM, Dhingra V, Chatterjee A, et al. High prevalence of insulin resistance in postpubertal Asian Indian children is associated with adverse truncal body fat patterning, abdominal adiposity and excess body fat. *Int J Obes Relat Metab Disord* 2004; 28 : 1217-26.
103. Sharma BS, Kumar MG, Chandel R. Prevalence of asthma in urban school children in Jaipur, Rajasthan. *Indian Pediatr* 2012; 49 : 835-6.
104. Dhabadi BB, Athavale A, Meundi A, Rekha R, Suruliraman M, Shreeranga A, et al. Prevalence of asthma and associated factors among school children in rural South India. *Int J Tuberc Lung Dis* 2012; 16 : 120-5.
105. Jagnoor J, Suraweera W, Keay L, Ivers RQ, Thakur JS, Jha P; Million Death Study Collaborators. Unintentional injury mortality in India, 2005: Nationally representative mortality survey of 1.1 million homes. *BMC Public Health* 2012; 12 : 487.
106. Road accidents in India 2011. New Delhi: Transport Research Wing, Ministry of Road Transport and Highways, Government of India. 2012. p. 67. Available from: <http://morth.nic.in/showfile.asp?lid=835>, accessed on January 14, 2013.
107. Report on causes of death in India 2001-2003. New Delhi: Office of the Registrar General, India. Ministry of Home Affairs; 2009 p. 84. Available from: http://www.cgghr.org/wordpress/wp-content/uploads/Causes_of_death_2001-03.pdf, accessed on January 14, 2013.
108. Aeron Thomas A, Jacobs GD, Sexton B, Gururaj G, Rahman F. The involvement and impact of road crashes on the poor: and India, Bangladesh case studies. United Kingdom: Report No. PR/INT/2TS 2004. Transport Research Laboratory; 2004. p. 34.
109. Gururaj G, Bangalore Road Safety and Injury Prevention Program Collaborators Group. Bangalore road safety and injury prevention program: results and learning, 2007 - 2010. Bangalore: National Institute of Mental Health &

- Neuro Sciences; 2011. p. 23. Publication No. 81. Available from: <http://www.nimhans.kar.nic.in/epidemiology/bispp/brsipp2011a.pdf>, accessed on September 14, 2012.
110. Sharma B, Singh VP, Sharma R, Sumedha. Unnatural deaths in Northern India: a profile. *J Indian Acad Forensic Med* 2004; 26 : 140-6.
 111. Dandona R, Kumar GA, Ameratunga S, Dandona L. Road use pattern and risk factors for non-fatal road traffic injuries among children in urban India. *Injury* 2011; 42 : 97-103.
 112. Dandona R, Kumar GA, Ameer MA, Ahmed GM, Dandona L. Incidence and burden of road traffic injuries in urban India. *Inj Prev* 2008; 14 : 354-9.
 113. Violence. World Health Organization. Available from: <http://www.who.int/topics/violence/en/>, accessed on January 15, 2013.
 114. Youth violence and alcohol fact sheet. World Health Organization. Available from: http://www.who.int/violence_injury_prevention/violence/world_report/factsheets/ft_youth.pdf, accessed on August 4, 2013.
 115. Sarkar M. A study on domestic violence against adult and adolescent females in a rural area of West Bengal. *Indian J Community Med* 2010; 35 : 311-5.
 116. Ackerson LK, Subramanian SV. Domestic violence and chronic malnutrition among women and children in India. *Am J Epidemiol* 2008; 167 : 1188-96.
 117. Acharya R, Ram F, Jejeebhoy SJ, Singh A, Santhya K, Ram U, *et al*. Physical and sexual violence within marriage among youth in India: findings from the youth in India, situation and needs study 2009. Available from: <http://iussp2009.princeton.edu/papers/93402>, accessed on August 21, 2012.
 118. Deb S, Modak S. Prevalence of violence against children in families in Tripura and its relationship with socio-economic factors. *J Inj Violence Res* 2010; 2 : 5-18.
 119. Baruah A, Barua A. Epidemiological study of violence: a study from North East India. *Indian J Community Med* 2007; 32 : 137-8.
 120. Munni R, Malhi P. Adolescent violence exposure, gender issues and impact. *Indian Pediatr* 2006; 43 : 607-12.
 121. Sharma R, Grover VL, Chaturvedi S. Risk behaviors related to inter-personal violence among school and college-going adolescents in south Delhi. *Indian J Community Med* 2008; 33 : 85-8.
 122. Gururaj G, Isaac MK, Girish N, Subbakrishna DK. *Final report of the pilot study establishing health behaviours surveillance in respect of mental health*. Report No.: WR/IND HSD 001/G – SE/02/413814. Bangalore: National Institute of Mental Health & Neuro Sciences; 2004. p. 69.
 123. Pandey A, Mishra RM, Reddy DC, Thomas M, Sahu D, Bharadwaj D. Alcohol use and STI among men in India: evidences from a national household survey. *Indian J Community Med* 2012; 37 : 95-100.
 124. Child welfare. Ministry of Women and Child Development, Government of India. Available from: <http://wcd.nic.in/cwnew.htm>, accessed on January 15, 2013.
 125. National policy on Education, 1986 (as modified in 1992) with National Policy on education, 1968. New Delhi: Department of Education, Ministry of Human Resource Development, Government of India; 1998. Available from: http://mhrd.gov.in/sites/upload_files/mhrd/files/NPE86-mod92.pdf, accessed on January 15, 2013.
 126. *Sarva Shiksha Abhiyan*. Programme for universalization of elementary education. Department of School Education & Literacy, Ministry of Human Resource Development, Government of India. Available from: <http://ssa.nic.in/whos-who/departement-of-school-education-Literacy-ministry-of-hrd>, accessed on January 22, 2013.
 127. *Rashtriya Madhyamik Shiksha Abhiyan*. Department of School Education & Literacy, Ministry of Human Resource Development, Government of India. Available from: http://mhrd.gov.in/rashtriya_madhyamik_shiksha_abhiyan, accessed on January 22, 2013.
 128. National policy for the empowerment of women (2001). Ministry of Women & Child Development, Government of India. Available from: www.wcd.nic.in/empwomen.htm, accessed on January 22, 2013.
 129. Guidelines for the *Balika Samridhhi Yojana* (BSY) (Recast Scheme). Ministry of Women & Child Development, Government of India. Available from: <http://wcd.nic.in/BSY.htm>, accessed on January 22, 2013.
 130. Scheme of National child labour project revised-2003. Ministry of Labour and Employment, Government of India. Available from: <http://labour.gov.in/upload/uploadfiles/files/schemes/Scheme%20of%20National%20Child%20Labour%20Project%20Revised.pdf>, accessed on September 17, 2013.
 131. Revised guidelines. Special projects for placement linked skill development of rural youths under Aajeevika (NRLM). Ministry of Rural Development, Government of India. Available from: http://rural.nic.in/sites/downloads/programmes-schemes/SGSY_SpecialProjectsGuidelines.pdf, accessed on January 22, 2013.
 132. National policy for persons with disabilities (Page 9) - Acts/ Rules & Regulations/Policies/Guidelines/Codes/Circulars/ Notifications - Empowerment of Persons with Disabilities: Ministry of Social Justice and Empowerment, Government of India. Available from: <http://socialjustice.nic.in/nppde.php?pageid=9>, accessed on January 22, 2013.
 133. Implementation guide on RCH II Adolescent Reproductive Sexual Health strategy: for state and district programme managers. Ministry of Health and Family Welfare, Government of India; 2006. Available from: [www.nrhmhp.gov.in/sites/default/files/files/ARSH-guidelines\(1\).pdf](http://www.nrhmhp.gov.in/sites/default/files/files/ARSH-guidelines(1).pdf), accessed on January 16, 2012.
 134. International Institute for Population Sciences (IIPS), Population Council. Youth in India: situation and needs 2006-2007. Mumbai: IIPS; 2010. p. 396. Available from: <http://www.iipsindia.org/pdf/India%20Report.pdf>, accessed on September 16, 2012.
 135. National Youth Policy 2003. Department of Youth Affairs. Ministry of Youth Affairs and Sports, Government of India. Available from: <http://yas.nic.in/index2.asp?linkid=47&slid=70&sublinkid=32&langid=1>, accessed on January 16, 2013.

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