Anvikshiki
The Indian Journal of Research
Bi-Monthly International Journal of All Research

Editor in Chief
Dr. Maneesha Shukla, maneeshashukla76@rediffmail.com

Review Editors
Prof. H. D. Khanna, Head Department of Biophysics, Institute of Medical Sciences Banaras Hindu University, Varanasi U.P. India
Ranjan S. Khanna, Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi U.P. India

Editors
Dr. Mahendra Shukla, Dr. Anshumala Mishra

Editorial Board
Dr. Anita Singh, Dr. Bhavna Gupta, Dr. Madhavi Shukla, Dr. S. M. Shukla, Dr. Nilmani Prasad Singh, Dr. Reena Chatterjee, Dr. Pragya Srivastava, Dr. Anup Datt Sharma, Dr. Padmini Ravindra Nath, Manoj Kumar Singh, Deepak Kumar, Archana Rani, Avanish Shukla, Vijayalaxmi, Kavita, Jyoti Prakash, Rashmi Saxena., Dr. A. K. Thakur, Narendra Shanker Tripathi, Anil Kr. Tripathi, Dr. Amit Vaibhav.

International Advisory Board
Dr. Javad Khalatbari (Tonekabon, Iran.), Dr. Shohreh Ghorbanshiroudi (Tonekabon, Iran.), Mohammad Mojtaba Keikhayfarzaneh (Zahedan, Iran.), Saeedeh Motamed (Tonekabon, Iran.), Majid Karimzadeh (Iran), Phra Boonserm Sritha (Thailand), Rev. Dodamgoda Sumanaransi Thero (Sri Lanka), Phra Chutidech Sansombat (Bangkok, Thailand), Rev. T. Dhammaratana (Sri Lanka), P. Treerachi Soda (Thailand), Sita Ram Bahadur Thapa (Nepal)

Manager
Maheshwar Shukla, maheshwar.shukla@rediffmail.com

Abstracts and Indexing

Subscriptions
Anvikshiki, The Indian Journal of Research is Published every two months (January, March, May, July, September and November) by mpsavo Press, Varanasi, U.P. India. A Subscription to The Indian Journal of Research : Anvikshiki Comprises 6 Issues in Hindi and 6 in English and 6 Extra Issues. Prices include Postage by Surface mail, or For Subscription in the India by Speed Post, Airmail rates are also available on request. Annual Subscriptions Rates (Volume 3,6 Issues in Hindi, 6 Issues in English and 6 Issues of science 2012):

Subscribers
Institutional : Inland 4,000+500 Rs. P.C., Single 1500+51 Rs.P.C., Overseas 6000+2000Rs. P.C., Single 1000+50 Rs.P.C.
Personal : 2,500+500 Rs. P.C., Single 500+51 Rs. P.C., Overseas 5000+2000Rs.P.C., Single 1000+50Rs. P.C.

Advertising & Appeal
Inquiries about advertising should be sent to editor’s address. Anvikshiki is a self financed Journal and support through any kind or cash shall be highly appreciated. Membership or subscription fees may be submitted via demand draft in favor of Dr. Maneesha Shukla and should be sent at the address given below. Sbi core banking cheques will also be accepted.

All correspondence related to the Journal should be addressed to
B.32/16 A., Flat No.2/1, Gopalkunj, Nariya, Lanka, Varanasi, U.P., India
Mobile : 09935784387, Tel.0542-2310539, e-mail : maneeshashukla76@rediffmail.com, www.anvikshikijournal.com
Office Time : 3-5 P.M. (Sunday off)

Journal set by
Maheshwar Shukla, maheshwar.shukla@rediffmail.com
9415614090

Printed by
mpasvo Press

Maneesha Publication
(Letter No V-34564, Reg.533/2007-2008)
B-32/16-A-2/1, Gopalkunj, Nariya, Lanka
Varanasi, U.P. India
Comparative Study of Patient Controlled Epidural Analgesia (PCEA) For Labour Pain Using Bupivacain, Bupivacain With Fentanyl or Clonidine- Prospective, Double-blinded, Randomized Sequential-allocation Study. 1-9

Shaheen Bano, Shashi Prakash and Yashpal Singh

The prevalence of Diabetes Mellitus its current treatment trends 10-16

Amit Vaibhav, O. P. Singh and Anil Kumar Tripathi

An Introduction To Esophageal Cancer: Pathogenesis, Types And Risk Factors 17-21

Saurabh Singh Rathore

Leech Therapy in Acute Filarial Attacks 22-25

Anil Kumar Tripathi, S. J. Gupta, S.C. Varshney and Amit Vaibhav

Prevalence of Diabetes and Pre-diabetes In Urban Population In India: A Review 26-29

Reema Singh and Mayank Srivastava

Assessment of Nutritional Status of Adolescent Girls in Rural Area of District Varanasi 30-34

Sweta Singh, Dr. Sangeeta Kansal and Dr. Alok Kumar

Use of Formative Research to Optimize Infant and Young Child Feeding Practices (IYCF) in Developing Countries. 35-42

Fahmina Anwar, Ratan.K.srivastava and S.P.Singh

Statistical Analysis of Physico-chemical Characteristics of Sewage Discharge into the River Ganga During Navratri Mela At Vindhyachal, Mirzapur. 43-49

Kshama Singh and B. D. Tripathi

Comparative study of Cytology and Quantitative Cytology in the Surveillance of None—Muscle-Invasive Bladder Cancer 50-56

Archana Rani

Study of Simplex Method For Linear Programming: An Overview 57-60

Sanjeev Kumar Singh and Dr. Kameshwar Singh

Hematocrit and its Impact on Quantitative Bio-analysis using Dried Blood Spot Technology 61-67

Ajay Kumar

Analysis – DEA and fuzzy: a case study of Academic Dept. 68-72

Manoj Kumar Verma and Dr. Kameshwar Singh

Determination of optical properties of human blood using Monte Carlo simulations technique 73-78

Ajay Kumar
ASSESSMENT OF NUTRITIONAL STATUS OF ADOLESCENT GIRLS IN RURAL AREA OF DISTRICT VARANASI

SWETA SINGH*, DR. SANGEETA KANSAL**, AND DR. ALOK KUMAR***

Declaration
The Declaration of the authors for publication of Research Paper in The Indian Journal of Research Anvikshiki ISSN 0973-9777 Bi-monthly International Journal of all Research: We, Sweta Singh, Sangeeta Kansal and Alok Kumar the authors of the research paper entitled ASSESSMENT OF NUTRITIONAL STATUS OF ADOLESCENT GIRLS IN RURAL AREA OF DISTRICT VARANASI declare that, We take the responsibility of the content and material of our paper as We ourself have written it and also have read the manuscript of our paper carefully. Also, We hereby give our consent to publish our paper in Anvikshiki journal. This research paper is our original work and no part of it or its similar version is published or has been sent for publication anywhere else. We authorise the Editorial Board of the Journal to modify and edit the manuscript. We also give our consent to the Editor of Anvikshiki Journal to own the copyright of our research paper.

Abstract
Adolescence is an intense anabolic period when requirements for all nutrients increases. Unsound food habits and lack of nutritional awareness are considered to be the main factors in determining nutritional status in rural areas. Adolescents are more vulnerable to malnutrition. (WHO, 1994). The aim of this study is to assess the nutritional status of adolescent girls using weight and height measurement. This is a cross-sectional study design using multistage random sampling method. 650 adolescent girls aged 15-19 years were selected as the study subjects. Pertinent information was obtained on a predesigned and pretested Interview schedule. The data thus obtained was analysed using SPSSv16.0. Analysis shows that 26.6% of adolescent girls were undernourished (BMI < 18.5) & 16.3% adolescent girls were at high risk of developing obesity in near future due to increased (BMI > 25.9). Caste, religion and marital status were significantly (p < 0.05) associated with nutritional status of adolescents. Therefore the study recommends the strong need of nutritional education for adolescents in the rural area. Focus will be given to adolescents who are married & belong to weaker section of society.

Key words: BMI, Adolescents, Malnutrition, Obesity

Introduction
Adolescence is the transitional period between childhood and adulthood. During this period individual move towards physical and psychological maturity, and economic independence and acquire their adult identity. Demographically, India is a young country today as more than 70% of the population is under

*Research scholar, Department of Community Medicine [Institute of Medical Sciences] BHU Varanasi (U.P.) India. e-Mail : sweta887170@gmail.com

**Associate Professor, Department of Community Medicine [Institute of Medical Sciences] BHU Varanasi (U.P.) India.

***Assistant Professor, Department of Community Medicine [Institute of Medical Sciences] BHU Varanasi (U.P.) India.
the age of 35. According to census 2001, there are 225 million adolescents in the age group of 10 to 19 years. Adolescence is an intense anabolic period when requirements for all nutrients increase. This period is very crucial since these are formative years in the life of an individual when major physical, psychological and behavioural changes take place. Adolescent girls, constituting nearly one tenth of Indian population, form a crucial segment of the society. The girls constitute a more vulnerable group especially in the developing countries where they are traditionally married at an early age and are exposed to greater risk of reproductive morbidity and mortality. In general adolescent girls are the worst sufferers of the ravages of various forms of malnutrition because of their increased nutritional needs and low social power. Nutritional deficiencies have far reaching consequences, especially in adolescent girls. If their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting under nutrition to future generation. Unfortunately assessment of nutritional status of adolescent girls has been the latest explored area of research particularly in rural India. Malnutrition prevails in rural area due to low economic status, less awareness about healthy diet of adolescent girls. Hence it is essential to assess the nutritional status of adolescent girls, especially in rural area.

**Objectives**

1. To assess the nutritional status of adolescent girls
2. To ascertain the association between different socio-demographic characters (caste, religion, and marital status) and nutritional status.

**Material and Methods**

A community based cross-sectional study was conducted during January 2011 to July 2011. Taking into consideration the time restraints and convenience, eight villages from eighty-four village panchayats in Chiraigaon community development block were selected through multistage random sampling. Six hundred and fifty adolescent girls of the age group 15-19 years were interviewed. Height & weight were measured using standard techniques. Nutritional assessment was done on the basis of BMI. Pertinent information on socio demographic variables was obtained on a pre-design and pre-tested interview schedule.

Following standard techniques were used for measurements:

*Height:* Height in centimetres was marked on a wall with the help of a measuring tape. All girls were measured against the wall without foot wear and with heels together and their heads positioned so that the line of vision was perpendicular to the body. A glass scale was brought down to the topmost point on the head. The height was recorded to the nearest 1 cm. (Maiti Soumyajit et al)

*Weight:* The weight was measured using a weighing machine (Libra) with an accuracy of + 100gm. The subjects were asked to remove their footwear before measuring their weight. The scales were recalibrated after each measurement. Accuracy of the weighing scale was verified from time to time against known weights. (Gupta M.K. et al)

*BMI:* BMI of the study subject was calculated by using the formula weight (kg)/height^2 (m^2). For grading proposed criteria of BMI for Asians (Choo V 2002) and CDC (2010) was adopted.

**Statistical Analysis:** Data thus generated were analysed using SPSS software.

**Results**

Out of the 650 adolescent girls participated in the study majority (91.7%) were Hindus. Caste wise distribution shows that more than fifty percent were belong to OBC category, 28% General, and only
13.4% were SC. In the study area, majority of the respondent were 71.6% school going and approx. one third were school dropouts. Almost same findings were observed in relation to marital status of respondents, three fourth of the total were unmarried & only 9.5% were married and living with their husband. There is one more important category of adolescent girls who are married (13.2%) but gauna was not done. Out of the total socio demographic variables considered in the study significant association was seen with caste, religion, and marital status only.

The findings of this study (shown in pie-diagram) shows that out of 650 adolescent girls, more than 50% were having BMI between 18.5-24.9, and 27% were below 18.5 only 16% were above 24.9 & at higher risk of developing obesity.

Out of total 650 adolescent girls 13.4%, 58.6% and 28% belonged to SC, OBC and Other caste category, respectively. Nutritional status of adolescent girls was found significantly (p <0.05) associated with their caste. Under-nutrition was significantly high among girls who belonged to Schedule Caste category. Under different caste categories 39.1%, 26.6% and 22.0% study subjects were underweight in SC, OBC and Other caste groups, respectively. This variation in under-nutrition among girls from different caste groups may be due to variation in their socioeconomic characteristics and thereby difference in availability of quality food. (Table: 1)

**TABLE 1 Distribution of BMI according to Caste**

<table>
<thead>
<tr>
<th>CASTE</th>
<th>Underweight (BMI &lt; 18.5)</th>
<th>Normal weight (BMI 18.5 – 24.9)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Schedule Caste</td>
<td>34</td>
<td>39.1</td>
<td>53</td>
</tr>
<tr>
<td>Other Backward Caste</td>
<td>99</td>
<td>26.6</td>
<td>282</td>
</tr>
<tr>
<td>Other Caste (General)</td>
<td>40</td>
<td>22.0</td>
<td>142</td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>26.6</td>
<td>477</td>
</tr>
</tbody>
</table>

Chi-square(x^2)=9.003, df=2, p=0.011

Majority (91.7%) of adolescent girls were Hindu by religion. Religion was found to have a significant (p <0.05) influence on nutritional status of adolescent girls. Hindu girls were more vulnerable to under nutrition (27.7%) in comparison to Muslim girls (14.8%). This variation in the trend indirectly represents religion wise variability in food accessibility and dietary intake. (Table: 2)

**TABLE 2 Distribution of BMI according to Religion**

<table>
<thead>
<tr>
<th>Religion</th>
<th>Underweight (BMI&lt;18.5)</th>
<th>Normal weight (BMI=18.5-24.5)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Hindu</td>
<td>165</td>
<td>27.7</td>
<td>431</td>
</tr>
<tr>
<td>Muslim</td>
<td>8</td>
<td>14.8</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>26.6</td>
<td>477</td>
</tr>
</tbody>
</table>

Chi-square(x^2)=4.199, df=1, p=0.040
As much as three forth (75.5%) respondents were unmarried while 24.5% girls were married or engaged to be married. Out of these married subjects 41.9% were biologically married at the time of interview. Table 3 indicates that nutritional status of adolescent girls was significantly (p <0.05) associated with their marital status. The girls who were engaged to be married were found more at the risk of under-nutrition (63.6%) than the girls who were unmarried, biologically married and married but still waiting for gauna. That represents the girl’s psychology to look slim and beautiful at the time of marriage, so indulge in dieting and other aggressive physical activities to reduce their weight drastically within a short span of time. Biological marriage and complete settlement of family was showing a psychological satiety effect on nutritional status.(Table:3)

**TABLE 3 Distribution of BMI on the basis of Marital status of adolescent girls**

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Underweight (BMI&lt; 18.5)</th>
<th>Normal weight (BMI=18.5-24.9)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Unmarried</td>
<td>129</td>
<td>26.3</td>
<td>362</td>
</tr>
<tr>
<td>Married (living with husband)</td>
<td>10</td>
<td>16.1</td>
<td>52</td>
</tr>
<tr>
<td>Married (Awaiting gauna)</td>
<td>27</td>
<td>31.4</td>
<td>59</td>
</tr>
<tr>
<td>Engaged to be married</td>
<td>7</td>
<td>63.6</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>26.6</td>
<td>477</td>
</tr>
</tbody>
</table>

Chi-square($x^2$)=1.22, df=3, p=0.007

**Discussion**

Adolescents have specific health and development needs, and many face challenges that hinder their well being. In the present study 26.6% of adolescent girls were underweight and 16.3% were found at high risk of overweight and obesity. Most of the girls in the study area were having normal BMI (57%). This variation is due to adequate knowledge and awareness regarding nutritional health, because majority of the girls were school going. Choudhary S et al reported that 68.52% of adolescents had BMI less than 18.5 in rural area of Varanasi. This study finding is in contrast with our study findings. The extent of undernutrition was slightly lower (27%) in our study in comparison to 36.49% of undernutrition reported by Mukhopadhya A et al (2005). The findings in the study of Shivaramakrishna et.al (2011) reported that there is higher prevalence of undernutrition in adolescent girls, this is in contrast with our findings. The study findings of Deshmukh et al is somewhat coherent to our study because it reported 44% of adolescent girls have normal weight in rural areas. Undernutrition was prevalent among the rural adolescent girls of Ethiopia(Afework et al), this is again in contrast with our findings. Prevalence of malnutrition in the present study (43%) appeared to be distinctively lower than the study done by Maiti et al(71.7%). The correlation between nutritional status and demographic characters are similar to the study done by Choudhary et al and T Kumar Ashok. The rate of undernutrition among adolescent girls of the present study(27%) demonstrated a significantly higher rate of undernutrition compared to Bangladeshi girls(16%) studied by Ahmed et al.(1998), but lower than Kenyan refugee girls(55%) and rural Indian girls(40%) reported by IRC(1997) and Venkaiah et al(2002) respectively.

**Conclusion & Recommendations**

This study found that majority(57%) of adolescent girls have normal BMI, 27% have lower BMI, if their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting undernutrition to future generations.
Therefore it is essential to provide nutritional education to adolescent girls, especially in rural areas and to the weaker sections of the society. Adolescent girls (16%) have higher BMI; these overweight and obese girls predispose to heart diseases, hypertension, and other chronic diseases near future.

Therefore, it is essential to implement adolescent-friendly health services at primary health care level with emphasis on nutritional counselling component both for married & unmarried. This will decrease the poorly nourished adolescent mothers, who are more likely to give to low birth-weight babies, perpetuating a cycle of health problems which pass from one generation to another.

REFERENCES


SUBMISSION OF PAPERS

Contributions should be sent by email to Dr. Maneesha Shukla Editor-in-Chief, Anvikshiki, The Indian Journal of Research (maneeshashukla76@rediffmail.com), www.onlineijra.com

Papers are reviewed on the understanding that they are submitted solely to this Journal. If accepted, they may not be published elsewhere in full or in part without the Editor-in-Chief’s permission. Please save your manuscript into the following separate files - Title; Abstract; Manuscript; Appendix. To ensure anonymity in the review process, do not include the names of authors or institution in the abstract or body of the manuscript.

Title: This title should include the manuscript, full names of the authors, the name and address of the institution from which the work originates the telephone number, fax number and e-mail address of the corresponding author. It must also include an exact word count of the paper.

Abstract: This file should contain a short abstract of no more than 120 words.

MANUSCRIPT: This file should contain the main body of the manuscript. Paper should be between 5 to 10 pages in length, and should include only such reviews of the literature as are relevant to the argument. An exact word count must be given on the title page. Papers longer than 10 pages (including abstracts, appendices and references) will not be considered for publication. Undue length will lead to delay in publication. Authors are reminded that Journal readership is abroad and international and papers should be drafted with this in mind.

References should be listed alphabetically at the end of the paper, giving the name of journals in full. Authors must check that references that appear in the text also appear in the References and vice versa. Title of book and journals should be italicised.

Examples:
GUPTA,RAIKUMAR(2009), A Study of The Ethnic Minority in Trinidad in The Perspective of Trinidad Indian’s Attempt to Preserve Indian Culture, India: Maneesha Publication.

In the text, the name of the author and date of publication should be cited as in the Harvard system(e.g. Garland 1981: 41-2;Robertson and Taylor 1973:ii.357-9)If there are more than two authors, the first name followed by et al. is mandaatory in the text, but the name should be spelt out in full in the References. Where authors cite them as XXXX+date of publication.

Diagrams and tables are expensive of space and should be used sparingly. All diagrams, figures and tables should be in black and white, numbered and should be referred to in the text. They should be placed at the end of the manuscript with there preferred location indication in the manuscript(e.g. Figure 1 here).

Appendix: Authors that employ mathematical modelling or complex statistics should place the mathematics in a technical appendix.

NOTE: Please submit your paper either by post or e-mail along with your photo, bio-data, e-mail Id and a self-addressed envelop with a revenue stamp worth Rs.51 affixed on it. One hard copy along with the CD should also be sent. A self-addressed envelop with revenue stamp affixed on it should also be sent for getting the acceptance letter. Contributors submitting their papers through e-mail, will be sent the acceptance letter through the same. Editorial Board’s decision will be communicated within a week of the receipt of the paper. For more information, please contact on my mobile before submitting the paper. All decisions regarding members on Editorial board or Advisory board Membership will rest with the Editor. Every member must make 20 members for Anvikshiki in one year. For getting the copies of ‘Reprints’, kindly inform before the publication of the Journal. In this regard, the fees will be charged from the author.

COPYRIGHT of the papers published in the Journal shall rest with the Editor.
Search Research papers of The Indian Journal of Research Anvikshiki ISSN 0973-9777 in the Websites given below

http://nkrc.niscair.res.in/BrowseByTitle.php?keyword=A

www.icmje.org

www.scholar.google.co.in

www.kmle.co.kr

www.fileaway.info

www.banaras.academia.edu

www.edu-doc.com

www.docslibrary.com

www.dandroidtips.com

www.printfu.org

www.cn.doc-cafes.com

www.freetechebooks.com

www.google.com

www.onlineijra.com