IJFANS
International Journal of Food And Nutritional Sciences

Volume 4, Issue 3, Apr-Jun 2015, www.ijfans.com e-ISSN: 2320-7876

INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

IMPACT FACTOR ~ 1.021

Official Journal of IIFANS

e-ISSN **2320 –7876** ***www.ijfans.com***
Vol.4, Iss.3, Apr-Jun, 2015

Research Paper ***Open Access***

INFLUENCE OF MASS MEDIA EXPOSURE ON BMI OF YOUTH

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Received on: 5th February, 2015 **Accepted on: 4th June, 2015**

Abstract

Over the past few decades, a dramatic transition has altered the diet and health of hundreds of millions of people across the third world. Media exposure is one of the major changes in lifestyle being implicated in obesity. The present study was planned with the objective to assess the media habits and its influence on obesity status of the youth (18-21 yrs.) of Haryana state (India) using BMI as indicating parameter. Seven districts namely Ambala, Karnal, Sonepat, Sirsa, Hisar, Rohtak and Gurgaon from the Haryana state of India were (n=1487) studied. Television was most assessed media followed by newspaper. Music videos followed by sports/adventure programmes and movies were most watched programmes. Subjects were divided into three groups as low exposure, medium exposure and high exposure depending upon their contact hours spent with any media form. Mean BMI of medium exposure group (21.80 ± 4.66) and high exposure group (21.95 ± 4.99) were significantly ($p<0.01$) higher than that of low exposure group (20.49 ± 3.62). No statistically significant difference ($p<0.05$) were depicted between waist to hip ratio of three exposure groups. The results indicated coexistence of underweight and overweight/obese subjects and a statistically significant ($p<0.01$) association between the BMI and levels of media exposure.

Key words: Obesity, BMI, Mass Media, Waist to Hip ratio, Young adults, India.

INTRODUCTION

Humankind has faced major shifts in dietary and physical activity patterns since paleolithic man emerged on Earth. Furthermore, dietary and activity pattern changes are paralleled by major changes in health status and by major demographic and socioeconomic changes. Nutrition transition today is malnutrition ensuing not merely from a need for food, but the need for high-quality nourishment. Foods rich in vitamins, minerals, and micronutrients such as fruits, vegetables, and whole grains have been substituted by foods heavy in added sugar, saturated fat, and sodium. This trend, which began in developed, industrialized countries, has spread to developing countries. These developing countries still stressed and struggling with hunger are now dealing with health problems associated with obesity. Malnutrition once identified by emaciated bodies, is now also associated with obesity. A number of studies have shown an emerging shift toward greater overweight among the poor in some countries (Monteiro *et al*., 2004; Ejike *et al*., 2010; Tharkar & Viswanathan, 2009).

Global mass media access has shifted in an impressive manner. Also the advertising content has shifted to more modern marketing. The effects of such changes in television programming are found throughout the developing world. The effect of such shifts in television access and programming are not fully understood. Minimal research has been conducted on how the increased media access has affected dietary and physical activity behavior, but it is clear from the extent of global food advertising growth that it is important (Fleming-Morn and Thiagarajah, 2005; Andreyeva *et al*., 2011; Mehlawat and Khetarpaul,2013). A range of attitudes and beliefs are evident in public discourse about the role of media exposure in ongoing nutrition transition. Parents are especially concerned with how media exposure and content may influence the healthy development of their children.

There is a dearth of regional data when it comes to media access and its effect on the nutritional status of youth. Considering the high pace of development in Haryana which is one of the smallest as well as the richest state of northern India and the fact that young adults in the age group 18-21 would form the main work force in near future, a surveillance of their status is important. The survey was undertaken to study the extent of media exposure and nutritional status of youth of Haryana (India). Present study provides the much lacking data of youth presently studying in colleges of Haryana.

MATERIALS AND METHODS

LOCALE OF THE STUDY

The research was carried out in Haryana state. Multistage sampling technique was used wherein at first stage state zone, followed by district and colleges were

selected for the study. The study was designed so that the sample should represent all agro climatic zones of Haryana. Haryana state can be divided into two agro climatic zones i.e. Eastern and western zone. The concept of agro climatic zones was chosen for the locale selection because it affects the cropping pattern, culture, economy as well as educational progress of any area. Seven districts were chosen representing each of the agroclimatic zone. One private and one government run college was selected from each district.

SELECTION OF RESPONDENTS

The present study was conducted on college going youth (18-21y). Consent from the Principal of the concerned colleges was taken. Colleges were visited with prior intimation. The students were briefed about the study through organized lectures. Only the students who themselves volunteered were included in the study. Of these 100-150 students were selected randomly for the study from each college. A total of 1500 subjects were studied from seven districts of Haryana (namely Ambala, Karnal, Sonepat, Sirsa, Hisar, Rohtak and Gurgaon) during 2010-2012. The physically challenged (differently abled) students were excluded. Subjects who did not provide complete information were also excluded from the study. Thus final data was available for 1487 subjects.

COLLECTION OF DATA

Keeping in view the objectives of investigation, a well structured questionnaire cum interview schedule was prepared in accordance with methodological procedure and pretested initially on 100 subjects. Based on the responses, the modifications were made in consultation with Statistician and subject experts to make it more functional. Data were collected by interview method.

ASSESSMENT OF MEDIA HABITS

Other than general background details, the questionnaire schedule included questions regarding the various available sources of mass media and routine exposure of subjects to media sources in terms of contact hours. Interaction of subjects with six given sources of media was categorized as 'Never', 'Rarely', 'Daily one hour', 'Daily two-three hours' and 'More than four hours daily'. All categories were scored from 0-4 (Never-0, Rarely-1, Daily one hr.-2, daily two-three hrs.-3, More than four hrs. daily-4). Minimum and maximum score possible for any subject, ranged from 0-24. Subjects were divided into three groups as low exposure (score 0-8), medium exposure (score 9-16) and high exposure (score 17-24) depending upon their score aggregate. The subjects were also asked about kind of programmes they watched in terms of 'Never', 'Rarely' and 'Very often'.

ASSESSMENT OF OBESITY STATUS

BMI

BMI was assessed using BMI monitor (Omron HBF 306, based on hand to hand BIA method).The subjects were asked to stand straight, without shoes, legs slightly apart. They were asked to hold the monitor with their thumbs touching the contact area properly. It was assured that there were no bends in their elbows or knees. The monitor displayed the readings for BMI.

WAIST CIRCUMFERENCE

Respondents were asked to wear minimum clothing. Waist circumference was measured to the narrowest point between the lowest rib and the iliac crest, with a flexible non-extensible tape placed directly on the skin while the subject standing balanced on both feet. The measurements were made with the tape held snugly, but not constricting, and at a level parallel to the floor. Measurements were made at the end of normal expiration. Readings were taken to the nearest 0.1 mm (WHO, 2008).

HIP CIRCUMFERENCE

Hip circumference was measured around the widest part of the buttocks with a flexible non-extensible tape placed parallel to the floor (WHO, 2008).

WAIST/HIP RATIO

WHR was calculated by measuring waist circumference and hip circumference and taking their ratio. Both the standard cut-off for WHR which denotes risk (>1 in men and >0.85 in women) and lower cut-offs (0.95 in men and 0.80 in women) were used (WHO, 2008). The collected data were analyzed and tests of significance were applied wherever applicable. The software SPSS 16.0 was used for statistical analysis.

RESULTS

MEDIA HABITS

The subjects were asked regarding their routine exposure to various sources of mass media in terms of contact hours. Radio and fashion Magazine were least frequently assessed media source while Television was most frequently assessed followed by newspaper (Fig.1). TV was watched daily for one hour by 43.90 per cent of subjects, 2-3 hrs. by 23.33 per cent and for more than 4 hrs. Daily by 4.32 per cent of subjects. About 52.23 and 26.39 per cent of subjects respectively said they never or rarely listen to radio (Table 1.). Internet was assessed daily by 32.49 per cent of subjects only. Cartoons were the least preferred programmes among subjects. Music videos followed by sports/adventure programmes and movies were most watched programmes; 52.37, 42.8 and 42.32 per cent subjects admitted to watch these respective programs 'very often' (Fig.2).

Table 1- Interaction of subjects with different sources of mass media

Contact Period	Per cent Subjects Exposed (n=1487)
TV	1.69
Rarely	26.77
Daily 1 hr.	43.90
Daily 2-3 hrs.	23.33
More than 4 hrs. Daily	4.32
RADIO	
Never	52.23
Rarely	26.39

Daily 1 hr.	15.29
Daily 2-3 hrs.	2.77
More than 4 hrs. Daily	3.32
INTERNET	
Never	34.32
Rarely	33.18
Daily 1 hr.	23.78
Daily 2-3 hrs.	6.01
More than 4 hrs. Daily	2.70
NEWSPAPER	
Never	19.26
Rarely	40.54
Daily 1 hr.	35.54
Daily 2-3 hrs.	1.96
More than 4 hrs. daily	2.70
FASHION MAGAZINE	
Never	51.19
Rarely	28.63
Daily 1 hr.	14.38
Daily 2-3 hrs.	4.16
More than 4 hrs. daily	1.64
SCIENCE MAGAZINE	
Never	47.07
Rarely	28.75
Daily 1 hr.	17.51
Daily 2-3 hrs.	4.64
More than 4 hrs. daily	2.04

Only 9.56 per cent of subjects were categorized as highly exposed. Majority of subjects were in low exposure group (66.94 per cent) while 23.50 per cent were in medium exposure group (Table 2). There was a statistically significant difference between mean BMI of different exposure groups as determined by one-way ANOVA (F (2, 1485) = 18.71, p = .00). A Tukey *post-hoc* test revealed that the BMI of medium exposure group (21.80±4.66) and high exposure group (21.95±4.99) were significantly (p<0.01) higher than that of low exposure group (20.49±3.62). The difference between the medium and high exposure groups were not statistically significant (p <0.01). No statistically significant difference (p<0.05) were depicted between waist to hip ratio of three exposure groups by One-way ANOVA (F (2, 1485) = .757, p=.469)

OBESITY STATUS

As per WHO classification, the respondents were categorized as underweight (BMI<18), Normal weight (BMI18-24.99), overweight (BMI25-29.99) or obese (BMI >30). Mean BMI of underweight category was 17.19 ±1.56; that of normal weight, overweight and obese was 21.10± 1.95, 26.55±2.28 and 33.18±5.08 respectively (Table3). There was a statistically significant difference between mean BMI of these groups as determined by one-way ANOVA (F (3, 1484) = 1459.92, p = .00). A Tukey *post-hoc* test revealed significant (p<0.00) differences among all four groups. Mean waist to hip ratio for the four categories were 0.76±0.11 (underweight), 0.77±0.08 (normal weight), 0.81±0.07 (overweight) and 0.83±0.08 (obese). There was a statistically significant difference between mean waist to hip ratio of different health categories as determined by one-way ANOVA (F (3, 1484) = 21.38, p = .00). A Tukey *post-hoc* test revealed significant (p<0.00) differences among all groups except between overweight and obese (p=0.635).

Table 2- Media exposure and BMI of subjects (n=1487)

Media Exposure	% subjects	Mean BMI	Mean waist/hip ratio
Low exposure	66.94	20.49±3.62	0.77±0.09
Medium exposure	23.50	21.80±4.66[a]	0.78±0.09
High exposure	9.56	21.95±4.99[a]	0.77±0.07

Cells with different superscripts are significantly (p<0.01) different in respective column.

Table 3-Health category distribution of subjects from different media exposed groups (n=1487)

Media Exposure groups	Health categories based upon BMI (% subjects)				Chi square (df=6)
	Underweight	Normal weight	Over weight	Obese	40.773 P=0.001
Low exposure	32.62	55.83	9.52	2.03	
Medium Exposure	22.41	57.76	14.66	5.17	
High exposure	28.17	45.07	21.13	5.63	
Total (% subjects)	29.79	55.25	11.85	3.11	
Mean BMI*	17.19 ±1.56[a]	21.10± 1.95[b]	26.55±2 .28[c]	33.18±5 .08[d]	
Mean W/H ratio*	0.76±0. 11[a]	0.77±0. 08[b]	0.81±0. 07[c]	0.83±0. 08[c]	

* Row Values indicate Mean ±SD of 1487 subjects.
Cells with different superscripts are significantly (p<0.01) different in respective rows.

OBESITY STATUS IN RELATION TO MEDIA EXPOSURE

On the basis of BMI, only 9.52 and 2.03 per cent of subjects were overweight and obese in low exposure group whereas high exposure group had 21.13 and 5.63 per cent overweight and obese subjects respectively (Table 3). In total, 11.85 per cent of subjects were overweight and 3.11 percent were obese. Pearsons Chi square test revealed a statistically significant (p<0.01) association between BMI and levels of media exposure. A correlation and regression test between BMI and media exposure depicted a positive correlation between the two, r (1484) =.273 (p<0.001**).** The regression equation comes out to be y =.301(x) +18.895.

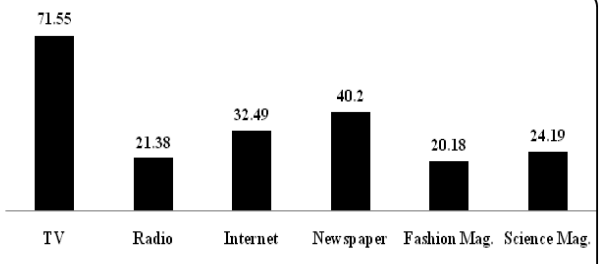

Fig. 1. Percent subjects having daily exposure to any of given media (n=1487)

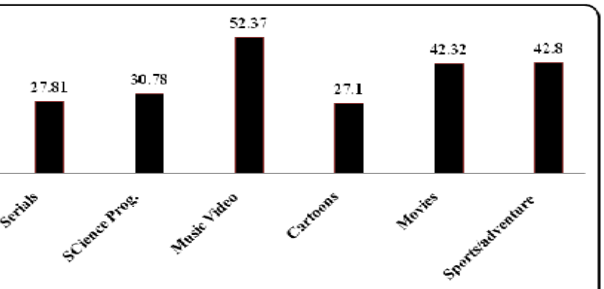

Fig. 2. Percent subjects preferring any given programme (n=1487)

DISCUSSION

Haryana is one of the smallest as well as the richest states in northern India with an area of 44,212 sq. km. According to Department of economic and statistical analysis Haryana. (2014), the State economy grew at an excellent average annual growth rate of 8.8 percent during the period of last 8 years (2005-06 to 2012-13), higher than the 8.0 percent growth rate of the Indian economy. It is one of the preferred investment destinations in the country. In terms of the annual income of households — an important indicator of economic prosperity — Haryana ranks third amongst Indian states in terms of per capita income. Basically an agriculture dependent state, Haryana along with its neighbor Punjab is known as the grain bowl of India. In the last decades, Haryana has made remarkable progress in all sectors including agriculture, education and industrialization.

Globalization has taken its toll on traditional diet of milk, coarse grains and vegetables. Youth of today prefers burgers, cold drinks and potato wafers to the traditional *Dal-Roti* meals (Sindhu, 2012). Nutrition transition is very much apparent in Haryana. However not many studies have addressed the issue particularly in the young adults who are going to be our main workforce for next few decades.

Of the many factors contributing to the global nutrition transition, media is a very important one. Media not only affects the eating habits of the youth through advertising and icon following but also cuts a big share from the time otherwise meant for physical activity and socialisation. Studies indicate that in adults, greater amounts of TV viewing are consistently associated with increased overweight risk, both cross-sectionally and longitudinally (Boyce, 2007; Williams *et al*., 2008). It is theorized that greater TV viewing is related to increased weight status and poorer health outcomes by reducing energy expenditure, predominantly through reducing time spent in physical activity, and increasing energy intake. Gentile *et al.,* (2004) observed that the average amount of time 8th- and 9th-grade students spent playing video games was 9 h per week. Males spent significantly more time playing video games each week than females (13 and 5 h per week, respectively). Compared to time spent playing video games, adolescents spent more time watching television and listening to music, but less time reading for pleasure. University of Michigan researchers and their colleagues who investigated whether diet, physical activity, sedentary behavior or television viewing predicted body mass index (BMI) among 3- to 7-year-old children, found that physical activity and TV viewing are most associated with overweight risk. TV was a bigger factor than diet. Inactivity and TV became stronger predictors as the children aged (Lumeng *et al*.,2006) As per NHANES reports, obesity in the age group 12-19 has increased from 6.1 per cent in 1971-74 to 17.4 per cent in 2003-04 in U.S. population (NHANES, 2013). Ogden *et al.,* (2012) reported obesity in 37.5 per cent of U. S. Adults and 16.9 per cent of children and adolescents.

As per the report of Royal College of Physicians (2013) obesity is increasing in prevalence in the UK such that approximately 25% of adults are obese. Among 10 to 11year-old girls, 17% are obese, and 20% of boys are also obese. The rate of increase may be slowing but projections from the Foresight report (2007) remain valid – namely that by 2050 the population of Britain will be mainly obese.

In India, the issue of overweight/obesity was not even addressed during National Family Health Survey-1 in 1992-1993. In 1998-99, NFHS-2 depicted dual burden with 36.2 per cent adult women as underweight and 10.6 per cent as overweight/ obese. Data was not available for male counterparts. As per NFHS-3 in 2005-2006, more than one-third of adults are too thin, and more than 10 percent are overweight or obese. Only 57 percent of men and 52 percent of women are at a healthy weight for their height (Arnold *et al*., 2009). Sindhu (2013) reported co-existence of under and over nutrition in the age group of 18-21 in Haryana. NFHS-3 also gives information on the exposure to several types of media. Overall, 35 percent of women and 18 percent of men age 15-49 are not regularly exposed to any media. The most common form of media for both women and men is television: 55 percent of women and 63 percent of men watch television at least once a week. However, among women, the next most common media source is the radio, whereas, for men, it is newspapers or magazines (IIPS, 2007). Sindhu and Rani (2014) reported body dissatisfaction among youth of Haryana and its association with media exposure. The need for addition of nutrition education as life skills was stressed upon. The effect of media exposure on nutritional status has not been widely studied in India.

Results from our study also corroborate the presence of dual burden in Indian context and the role of media exposure thereof. Our study indicates significant differences in BMI of subjects with different levels of media exposure. It also indicates that subjects spending more time with any form of media are more likely to be obese.

CONCLUSION

The present study was conducted in one of the most progressive states of Northern India and is probably the only one, reporting significant association of BMI with levels of media exposure. Mass media (television, radio, magazines, newspaper, pamphlets, internet etc.) plays a paramount role in today's society. Mass media are tools for the transfer of information, concepts, and ideas to both general and specific audiences. In present scenario, mass media are believed to have negative influences on young people's health-related attitudes and behaviors. There is a need to assess the extent of such effects and how the concept of media literacy can be used for communicating about health. Such studies would be instrumental in policy formulation for handling the malnutrition.

FUNDING/ SUPPORT

This work was supported by research grant from **'University Grants Commission'**, New Delhi, India.

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