



P-ISSN: 2349-8528
 E-ISSN: 2321-4902
 IJCS 2017; 5(1): 175-180
 © 2017 JEZS
 Received: 19-11-2016
 Accepted: 20-12-2016

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International Journal of Chemical Studies

Prevalence of diabetes mellitus and hypertension among elderly population in Dhaka City

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Abstract

Elderly populations are susceptible to many non-communicable diseases particularly, hypertension and diabetes. Lack of awareness regarding disease status and risk factors increase the complications and mortality. The aims of this study were: (i) to determine the prevalence of hypertension and diabetes in elderly people in this study, (ii) to identify the determinants of hypertension and diabetes. Cross-sectional study was conducted among 136 purposely selected participants aged 60 years and above in Dhaka city, Bangladesh. Structured questionnaire was used to collect information regarding prevalence and potential determinants of hypertension and diabetes. Age of the study subjects varied from 60 to 95 years and maximum numbers of the respondents were in the age group between 60-69 years. Among the study people more than seventy percent respondents were within the 60 -69 age group (73.5%) followed by (14.7%) were within the 70 – 79 age group. A there were 80 males (58.8%) and 56 females (41.2%). Most of the respondents were retired person (38%). Housewives were (22%). Only (16%) respondents were involved in business. Education status of elderly people varied from illiteracy to higher education. About 43% of the elderly respondents had completed up to secondary school level followed by intermediate level 30%. Muslims participants were (57%) and others included Hindu & Christian was (42.6%). Sixty eight percent respondents were married and rests of them were either unmarried or widowed or separated. Out of 136 respondents, (30.2%) were never smokers. More than one third of the respondents were currently smokers (44.1). More than the fifty percent respondents had no history of exercise (68.4%). Perceptions of respondents about their present health condition were ascertained. A total of 61 respondents (44.9%) felt their health was good, (25%) felt their health was satisfactory and (30%) of the respondents' perception was found to be poor. Among the study population overweight were (44.9%) followed by normal (31.6%). Rest was underweight (23.5%). DM and HTN were almost equal among the respondents followed by combination of both DM and HTN (24.3%). Only (5%) had other chronic diseases and (17.6%) had no chronic diseases. Among the respondent male had DM (22.5%), HTN (25%) and both DM and HTN was (28.7%). On the other hand, female respondents had DM (34%), HTN (23.2%) and both DM and HTN was (21.4%) and there was significant difference between sex and diseases. Among the female respondents (69%) were overweight. In case of male overweight were (27.5%) and statistically significant ($p < .05$, CI 95%). The high prevalence of hypertension and diabetes in the elderly population studied and identify an important public health problem. There is a need of regular screening of hypertension and diabetes and improved health care and education in the elderly.

Keywords: Diabetes mellitus, hypertension, elderly population

Introduction

Ageing is usually defined as a progressive, generalized impairment of function resulting in a loss of adaptive response to stress and in a growing risk of age associated diseases. Ageing is a natural biological phenomenon and nobody can escape it. It is a human right to seek longevity and healthy ageing. Demographically, the process of which the proportion of persons aged 60 years or older in the total population increase, and reaches the extent that the proportion of persons aged 60 years or older in the total population exceeds 10% is called population ageing. In these cases, the population is called an older population. One of the main features of the world population in the 20th century has been a considerable increase in the absolute and relative numbers of older people in both developed and developing countries. The number of persons aged 60 years or older is estimated to be nearly 600 millions in 1999, and is projected to grow to almost 2 billion by 2050. At that time the population of older persons will be larger than the population of children (0-14 years) for the first time in human history.

The majority of the world's older persons reside in Asia 53% [1]. In 1999, one of every 10 persons was aged 60 years or older by 2050, the United Nations projects that 1 person of every 5, and by 2150, 1 of every 3 will be aged 60 years or older. The percentage is currently much higher in the more developed regions than in the less developed regions, but the pace of ageing in the developing countries is more rapid, and their transition from a young to an old age structure will be more compressed in time [1].

Bangladesh is not only a country with a big population, but also a country with the most aged population. Owing to China's success in implementing a relatively strict family planning programme, the level of fertility is low and the cohorts of children and 7 young people are relatively small. Moreover, with the accompanying significant decline in mortality during the last few decades, the population in Dhaka is rapidly ageing. An increasingly important feature of societal ageing is the progressive ageing of the elderly population itself. The fastest growing age segment in many countries is the

"Oldest old", defined as persons aged 80 years and over. In 1999, the oldest old made up 11% of the population aged 60 years and older. By 2050, 19% of the older population will be aged 80 years and older. The number of centenarians (aged 100 years or older) is projected to increase 15-fold from approximately 145,000 in 1999 to 2.2 million people by 2050. The importance of the oldest old with regard to policy making will increase markedly in 21st century as a result of levels of morbidity and disability that are much higher than in other population groups, and the fact that the oldest old consume health and social services and benefits far out of proportion to their numbers. Another feature is that the majority of older persons are women. Among those aged 60 years or older, 55% are women. And among the oldest old, 65% are women [1]. In addition, the numbers of ageing women are increasing worldwide. At older ages, women are less likely to be married and more likely to be widowed than men, not only because they survive on average to higher ages, but also because most women marry men several years older than themselves. While more than three quarters (79%) of older men are married on a global basis, less than one half (43%) of older women are married (United Nations 1999). Because of the special physical, psychological, social and economic characteristics of women, older women should be paid more attention.

Bangladesh has currently a population of almost 148 million people and 6% are aged 60 years and over. It is projected that in the next twenty years figure will be almost double and will continue more than 10% of the total population in the country. A small proportion (around 6%) of the total population of Bangladesh constitutes the elderly population, but the absolute number of them is quite significant (about 7.2 million) and the rate of their increase is fairly high [2]. The majority are male in the urban area while most are women in the rural area. About 90% of the urban elderly males live alone and are married, whereas 89 percent of the rural elderly women living alone are widowed. An enormous proportion of the Bangladesh's elderly live in Dhaka city and show wide variations in health status. As with the urban elderly, locomotors, visual and hearing disabilities, as well as life-threatening conditions of coronary heart disease, diabetes and hypertension are common among urban elders. Moreover, most of the older people depend on other. And sometimes they do not get any support from other even his/her child. At this circumstances they will very much needed to support, shelter and healthy life. More than 85% of total diabetic

population throughout the world belongs to type 2 diabetes. Global prevalence of diabetes mellitus has been reported 6.6% for the years 2010 and projected to rise to 7.8% in the year 2030. Number of people with diabetes has been estimated to be 285 millions in the year 2010 and has been projected to rise to 438 million in the 2030.

Estimated national prevalence of diabetes mellitus of Bangladesh is 6.1% for the year 2010 [3]. A study was conducted to determine the prevalence of type 2 diabetes and impaired fasting glycemia in a rural population (aged ≥ 20 years) of Bangladesh. The crude prevalence of type 2 diabetes was 4.3% and IFG was 12.4%. The age-standardized prevalence of type 2 diabetes (95% CI) was 3.8% (3.12-4.49) and IFG was 13.0% (11.76-14.16). The subjects with higher family income had significantly higher prevalence of type 2 diabetes (5.9 vs. 3.5%, $P < 0.001$) and IFG (15.6 vs. 10.8%, $P < 0.001$) than those with lower income [4]. A small cross-sectional study was carried out to estimate the prevalence of type 2 diabetes mellitus and its risk factors in an urbanizing rural community of Bangladesh. The total prevalence of type 2 diabetes was 8.5%, men showed higher prevalence (9.4%) compared to women (8.0%) [5]. Type 1 diabetes is rare in Bangladesh.

Materials & method

A cross-sectional study was conducted to find out the prevalence of DM and HTN in elderly in Dhaka City. This study was carried out in indoor and outdoor units of Bangladesh Association for the aged and institute of Geriatric Medicine (BAAIGM) in Nut Shell Geriatric Hospital and National Health Care Network, Mirpur, Dhaka. The study was carried out from October 2010 to January 2011. The study was conducted upon elderly admitted and outpatient department into (BAAIGM) in Nut Shell Geriatric Hospital and National Health Care Network, Mirpur, Dhaka. Male and female patients were selected, willing to participate were included in this study. Inclusion criteria were Age ≥ 60 years. Sample size will be calculated using formula. $n = z^2pq/d^2$ Here, n = sample size, z = normal distribution = 1.96 at 95% confidence interval, p = prevalence of DM and HTN among elderly taken as 50% (Hence, prevalence rate is taken as 50%). $q = 1 - p$, d = acceptable error = 0.05

From the above formula the estimated sample size was 384. It is noted that 384 is the required number of sample size if simple random sampling technique would be used. But as in this study purposive sampling technique was used and due to the time limit, 136 samples were taken. Sample was collected purposively in elderly in Dhaka city. A semi-structured questionnaire was developed. The questionnaire was developed using the selected variables according to the specific objectives. The questionnaire contained questions related to socio-demographic characteristics, illness characteristics and other relevant information, and DM and HTN status assessed. A check list section was also developed. The data was collected in a pre-formed standard printed questionnaire after taking written informed consent of the patient. The procedure and purpose of study was explained to the patient. A detailed history was taken from the patient by interview. Every patient was examined thoroughly regarding height, weight, BMI were calculated data collection form was filled in at hospital at bed side and outpatient department every day except Friday. Statistical analysis was done by Statistical Package for Social Science (SPSS Inc, Chicago, Illinois, USA) software 16 versions. All data was expressed as mean with 95% confidence interval and percentage as

appropriate unless otherwise indicated. University ethical review committee approved this protocol.

Results

A cross sectional study was carried out to determine the prevalence of DM and HTN among elderly population in Dhaka city. Total 136 adult patients were selected according to inclusion and exclusion criteria. They were interviewed with a specific pre-designed and pre-tested questionnaire and some information were gathered by document review. Collected data were cleaned, edited and analyzed with the help of software SPSS windows version 16. The analyzed data have been presented in this chapter through tables and appropriate graphs.

Characteristics of the subjects

Age Group

Age of the respondents varied from 60 to 95 years and maximum numbers of the respondents were in the age group between 60-69 years. Among the respondents seventy percent were within the 60 -69 age group 73.5% followed by 14.7% were within the 70 – 79 age group. Eighty to ninety age groups were 9.6%. Only 2.2% were ninety plus age group.

Table 1: Age group among the respondents

Age group	Frequency (n)	Percentage (%)
60-69	100	73.5
70-79	20	14.7
80-89	13	9.6
90 plus	3	2.2
Total	136	100.0

Sex

There were 80 males 58.8% and 56 females 41.2%.

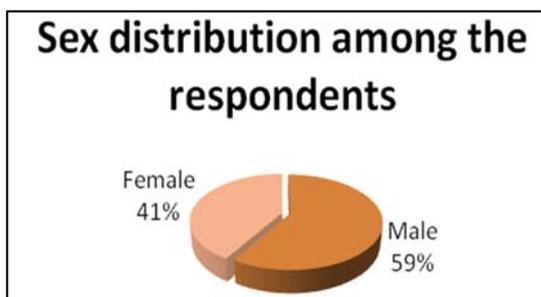


Fig 1: Sex distribution among the respondents

Occupation

Among the respondents, retired person were 38%, housewives 22%. Only 16% respondents were involved in business.

Table 2: Occupation among the respondents

Occupation	Frequency (n)	Percent (%)
House wife	30	22.1
Retired	52	38.2
Service	32	23.5
Business	22	16.2
Total	136	100.0

Educational Qualification

Education status among the respondents was varied from illiteracy to higher education. About 41.9% respondents were up to SSC level and followed by HSC level 30% and 12.5% had no education. About fifteen percent of the total respondents had received Bachelor and above.

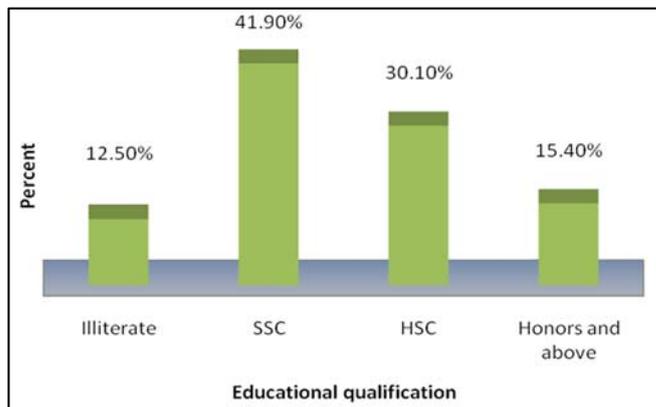


Fig 2: Educational qualifications among the respondents

Religion

Muslims participants were 57% and others included Hindus & Christen were 42.6%.

Table 3: Religious distributions among the respondents

Religion	Frequency (n)	Percent (%)
Muslim	78	57.4
Others	58	42.6
Total	136	100.0

Marital status

Sixty eight percent participants were married and rest of unmarried or widowed or separated.

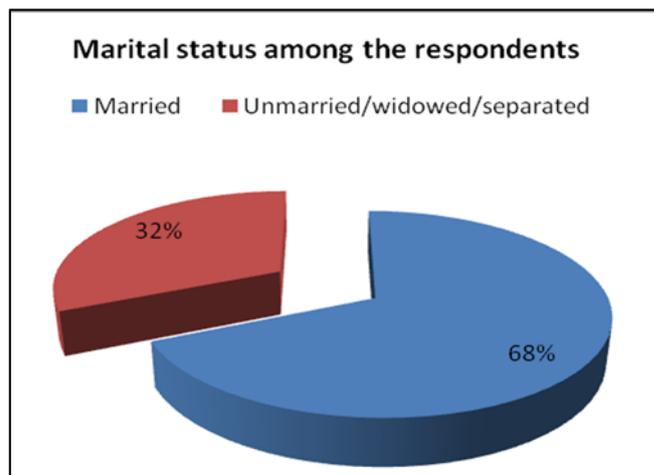


Fig 3: Marital status among the respondents

Smoking status

Out of 136 respondents 30.2% were never smokers. More than One third of the respondents were currently smokers 44.1. Only 25.7% had history of smoking.

Table 4: Smoking status among the respondents

Smoking status	Frequency (n)	Percent %
No history of smoking	41	30.2
History of smoking	35	25.7
Current smoking	60	44.1

Exercise

Among the respondents 68.4% had no history of exercise and 32% had history of exercise.

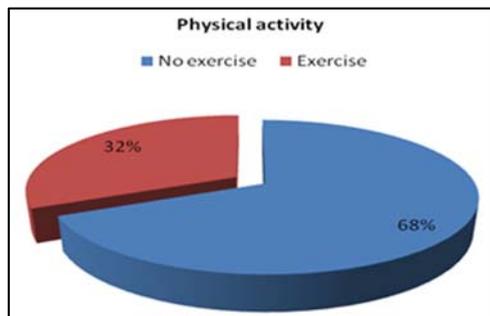


Fig 4: Physical activities among the respondents

felt their health was good, 25% felt their health was satisfactory and 30% of the respondent's perception was found to be poor.

Table 5: Perception about their health

Health perception	Frequency (n)	Percent (%)
Good	61	44.9
Satisfactory	34	25.0
Poor	41	30.1
Total	136	100.0

Perception about their health

Perceptions of respondents about their present health condition were ascertained. Among the respondents 44.9%

Body Mass Index (BMI) of the respondents

Among the respondents overweight were 44.9% followed by normal weight 31.6% and underweight 23.5%.

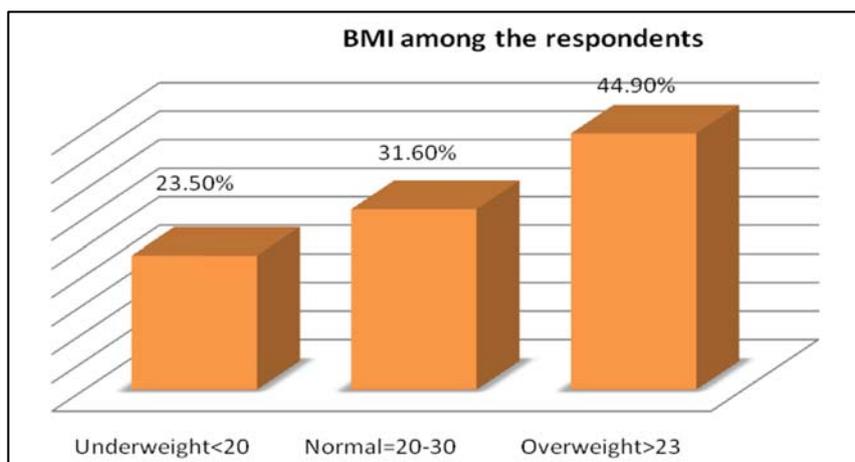


Fig 5: BMI of the Respondents

Chronic diseases

DM and HTN were almost equal among the respondents followed by combination of both (DM and HTN) 32.4%.

Only 5% had other chronic diseases and 17.6% had no chronic diseases.

Table 6: chronic diseases among the respondents

Disease	Frequency (n)	Percent (%)
No chronic diseases	24	17.6
DM	37	27.2
HTN	33	24.3
DM and HTN	35	25.7
Other chronic disease	7	5.1
Total	136	100.0

Sex related to disease

Among the respondents male had DM (22.5%), HTN (25%) and both DM and HTN was (28.7%). On the other hand,

female respondents had DM (34%), HTN (23.2%) and both DM and HTN was (21.4%). There was significant difference between sex and diseases.

Table 7: Sex related to disease

Sex	Normal	DM	HTN	DM and HTN	Others disease	P value
Male	19(26.3%)	18(22.5%)	20(25.0%)	23(28.7%)	1(1%)	.003 s
Female	5(8.9%)	19(33.9%)	13(23.2%)	12(21.4%)	7(12.5%)	

Sex and Body Mass index

Among the female respondents 69% were overweight. In case of male overweight were 27.5%. And statistically significant (p<.05)

Table 8: Sex and Body Mass index

Sex	Underweight<20n (%)	Normal=20-23 n (%)	Overweight>23 n (%)	Total	P value
Male	21(26.3%)	37 (46.3%)	22 (27.5%)	80(100.0%)	.000 s
Female	12 (21.4%)	6(10.7%)	38(67.9%)	56(100.0%)	

Discussion

Aging population is subjected to a susceptible to health problem in Bangladesh. Hypertension is becoming an important public health challenges due to its associated morbidity and mortality and cost of society [6]. Old age was found as a major risk factor of hypertension in Bangladesh like other developing countries. There is strong association with increase age. Thus, it is proved that age is an important risk factor for hypertension among the Bangladeshi people. Ample of literature supports this finding, such as [7] demonstrated old age as a potential risk factor for high blood pressure. World Health Organization also stated hypertension as a major public health problem in all age groups but especially the elderly people living in the developing countries were more vulnerable [8]. Waldestin also documented higher prevalence of hypertension up to 60% among older adults (older than 60 years) and in a longitudinal study over a 30 years period also found that prevalence of hypertension was increased with age [9]. Regarding the other risk factors of hypertension, living in the urban area was identified potential risk factor for hypertension in Bangladesh. As a third risk factor, we found that the subjects living alone, such as widow/ separated/ divorced were more likely to suffer from hypertension in the survey than the currently married subjects. Wang in China also observed that women never married divorced or separated were at higher risk of hypertension [10].

Regarding the association between exercise and hypertension, exercise can reduce risk of hypertension. However, the literature produces conflicting results, possibly owing to difficulties in achieving standardized definitions of exercise. The studies conducted in India showed there was significantly lower prevalence of hypertension among the subjects, who participate in physical exercise [11]. Similarly in US also illustrated exercise as a corner stone therapy for the primary prevention, treatment and control of hypertension and regular exercise was found effective measure to reduce blood pressure in older adults [12]. However, the study conducted in India, in which more physical activity was associated with a greater prevalence of hypertension in India [13]. In developing country, BD, most of the people involved in physical work that can be treated as a part of exercise therefore, significant relationship was not found in total subjects. However, in the subsection of the population, hypertension before the survey, there was positive relationship between exercise and hypertension. But it does not mean that exercise increases the hypertension. The subjects who had hypertension before, they started exercise to reduce the hypertension. Here, exercise was used as a secondary prevention of the diseases. Other study was produced by Lu which stated higher prevalence of exercise among hypertensive subjects than normotensive. Muntner also found similar reasons that once the patient is diagnosed as hypertensive, life style modification such as exercise and treatments were the only control measures [14].

A study conducted by Ontiveros [15] have observed that diagnosis and treatment of hypertension was associated with negative impact on health perception and daily activities stated that how and what people think about their health plays an important role in preventing disease. By positive thoughts, people can reduce risks for the development of many diseases. Similarly, Ontiveros also observed that attitudes regarding cause and treatment of hypertension were associated with use and under use of preventive health services [15].

In another study by Ford & Mokdad [16] pointed to determine the prevalence of diabetes mellitus (DM) in elderly (aged 65-

92 years).The medical records of 1096 elderly (642 females and 454 males) residing in 11 kibbutzim were reviewed for data regarding fasting blood glucose. Fasting blood glucose levels above 7.8 mmol/L was considered diagnostic for diabetes mellitus.

The data suggest that diabetes mellitus is common disorders in elderly respondents. DM in the elderly can usually be handled with diet and oral hypoglycemic drugs. There is no specific health care system for elderly in Bangladesh. Our findings and literature as a whole therefore, points to an urgent need of geriatric health program and is recommended to establish geriatric unit in each hospital. Government and local organizations should provide health services to the senior citizens as an essential health package and NCD survey need to be conducted regularly in these groups.

Conclusions

Elderly populations are susceptible to many non-communicable diseases particularly, hypertension and diabetes. Lack of awareness regarding disease status and risk factors increase the complications and mortality. The high prevalence of hypertension and diabetes in the elderly population studied, and the low level of prior diagnosis, identify an important public health problem. There is a need of regular screening of hypertension and diabetes and improved health care and education in the elderly.

References

1. United Nations. Department of public information and coalition, 1999.
2. Kabir ZN, Szebehely M, Tishelman C, Chowdhury AMR, Hojer B, Winbland B. Aging trends--Making an invisible population visible: The Elderly in Bangladesh. *J. Cross Cult. Gerontology*. 1998; 13:361-378.
3. IDF Diabetes Atlas, 2009
4. Sayeed MA, Sarraf Zadegan N, Amini NS. Blood pressure pattern in urban and rural areas in Isfahan, Iran. *Journal of Human Hypertension*. 2003; 11(7):425- 428.
5. Rahman M, Ramchandran A, Mary S, Annasami Y, Murugesan N, Chamukuttan S. High prevalence of Diabetes and Risk factors Associated with Urbanization in India, *Diabetes Care*, 2007; 31:893-898.
6. Sharma S, Krotas C. Hypertension. Retrieved January 20, 2009. from [http:// www.emedicine.medescape.com](http://www.emedicine.medescape.com)
7. Shirakawa T, Ozono R, Kasagi F, Oshima T, Kamada N, Kambe M. Differential impact of family history on age-associated increase in e prevalence of hypertension and diabetes in male Japanese workers. *Hypertens Res*, 2006; 29(2):81-7.
8. Waldestin SR, Brown JRP, Maier KJ, Katzel LI. Diagnosis of hypertension and high blood pressure levels negatively affect cognitive function of older adults. *Ann Behavior Medicine*, 2005; 29(3):174-80.
9. Cannel CC, Rust KF, Byrdholt DD, Eberhardt MS, Engelgau MM, Geiss LS. Prevalence of Diabetes and fasting glucose in Adults in the U.S. population, *Diabetes Care*, 1980; 29(6):1263-68.
10. Wang H. Effects of marital status and transition on hypertension in Chinese women: a longitudinal study *J Population Association of America March*, -31 April 02, 2005.
11. Chaudhary A, Lip GYH. Exercise and Hypertension. *Journal of Human Hypertension*. 2005; 19:585-87.

12. Pescatello LS, Franklin BA, Fagrid R, Farquhar WB, Kelley GA, Ray CA. Exercise and Hypertension. American College of Sports Medicine, 2004, 533-553.
13. Gupta R, Gupta S, Gupta VP, Prakash H. Prevalence and determinants of the hypertension in the urban population of Jaipur, in western. India. J. Hypertens. 1995; 13:1193-1200.
14. Muntner P, Dongteng GU, Xiqui WU, Xiufang D, Whelton PK. Factors Associated with Hypertension Awareness, Treatment and control in a Representative Sample of the Chinese population. Hypertension. 2004; 43:578-585.
15. Ontiveros JA, Black SA, Jakobi RC, Goodvin JS. Ethnic Variation in attitude toward hypertension in Adult age 75 & older. Preventive medicine, 1999, 446-9.
16. Ford ES, Mokdad AH. Fruit and vegetable consumption and diabetes mellitus incidence among us adults, Prev. Med. 2001; 32(1):33-9.