Global Research Journal of Public Health and Epidemiology: ISSN-2360-7920 Vol. 2(6): pp 037-042, June, 2014.

Full Length Research Paper

Factors associated with breakfast skipping among urban adults in Bangladesh

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Accepted 2nd June, 2014

Breakfast consumption has been identified as an important factor in the nutritional well-being of adults. The aim of the present study was to determine the prevalence of skipping breakfast and factors associated with skipping breakfast among urban adults of Bangladesh. A cross-sectional descriptive study was performed among 426 urban adults aged between 20 to 60 in Dhaka, Bangladesh using a self-administered questionnaire. The prevalence of skipping breakfast in relation to lifestyle habits was described and factors associated with breakfast consumption were identified using multiple logistic regression analysis. The overall prevalence of skipping breakfast was 39.5% and 60.5% for males and females, respectively. Logistic regression models found that the main factors associated with breakfast skipping among urban adults were gender, age, education, occupation, physical condition, appetite, sleeping quality and weight status. Breakfast skipping is highly prevalent among urban adult population in Bangladesh. Health promotion strategies should be used to encourage all adults to eat breakfast regularly.

Keywords: Breakfast consumption, healthy lifestyle, breakfast skipping, factors, health status, urban adults

INTRODUCTION

Breakfast as part of a healthful diet and lifestyle can positively affect adult's health and well-being (Szajewska and Ruszczynski, 2010; Nicklas et al., 2004; Mekary et al., 2012). Breakfast consumption is a marker for an appropriate dietary pattern in terms of both macro- and micronutrients (Albertson et al., 2008; Ruxton and Kirk, 1997)**.** Breakfast provides a significant proportion of total nutrient intake of the day with lower intakes of fat and higher intakes of carbohydrate, dietary fibre and certain micronutrients (Van den Boom et al., 2006; Morgan and Zabik, 1984; Williams, 2005)**.** Breakfast skipping is associated with a lower diet quality and concentrated energy intakes Williams, (2005) meeting two thirds of the Recommended Dietary Allowance for vitamins and minerals Mekary et al., (2013) and health-compromising behaviors in adults such as smoking, infrequent exercise, low education level, higher BMI (A Keski-Rahkonen,et al., 2003)**.** Breakfast eaters have a higher frequency of health promoting behaviors, such as feeling of energetic in their work, having more stress management skills, less tendency to eat unhealthy snacks in midmorning and possessing of less health problems. Several studies showed that skipping breakfast might put people on the fast track to weight gain, heart disease, osteoporosis, irritability or mood swings, menstrual irregularity, low energy levels, low memory and hormonal stress (Keim et al., 1997; Kleemola et al., 1999; Schlundt et al., 1992). Skipping breakfast is a common practice with 23% of adults and there is evidence that skipping breakfast is becoming more common (Stanton and Keast, 1989)**.** People who regularly consume breakfast eat 12% healthier throughout the day where Breakfast skipping is associated with a lower diet quality through higher protein intakes at lunch (Kral et al., 2011) and the consumption of snacks higher in energy and carbohydrate in the afternoon and evening (Dubois et al., 2009). A study from the Dairy Research Institute found that people who skip breakfast weigh more and have more unhealthy habits than those who eat breakfast. Another study showed that skipping breakfast in both childhood and adulthood is associated with larger waist circumstance, higher fasting insulin, total cholesterol and total LDL cholesterol concentrations (Smith et al., 2010)**.** A prospective study found that men who skipped breakfast had 21% higher risk of type 2

diabetes than did men who consumed breakfast (Mekary et al., 2012). Several factors are associated with breakfast skipping. Among those, gender, age, education, occupation, physical condition, appetite, sleeping quality and weight status are most common factors. Gender has most substantial influence on breakfast consumption considering the sociodemographic variables. A study (Shaw Mary 1998) showed that female respondents skipped breakfast more compared to their male respondents. However, a contradictory result was found in a cross-sectional survey conducted among medical students in the Inner Mongolia Medical College showed that male respondent skipped breakfast more compared with the female one (Juan Sun et al., 2013). Lack of time and habit privilege the reason behind breakfast skipping most often. Singleton and Rhoads, (1982**)** found that the most common reasons given for skipping were no time (43%) and not being hungry or habit of skipping (42%); less common reasons included being on a diet to lose weight, not feeling good, no one to prepare food, not liking the food served, and food not being available. Many people on a diet make the erroneous assumption that skipping breakfast would help them cut calories, but studies offered ample evidence that fasting made people hungrier and increased the appeal of high calorie foods and the amount people ate leading weight gain. Most cross-sectional studies that have examined the association between breakfast habits and measures of obesity in adults report an inverse association, even with adjustment for potential confounding factors (Singleton and Rhoads, 1982; Katharine et al., 2009; Summerbell et al., 1996; Wyatt et al., 2002; Lisa et al., 2008)**.** In a population based survey, it was found that the unadjusted odds ratio of obesity in breakfast skippers was two times more than non skippers (95% CI: 1.23 ; 1.06-1.43)(Huang et al., 2010).

Breakfast is considered the most important meal of the day for various reasons, but most of the adult used to skip their breakfast possessing detrimental health sequel. This is first documented study in Bangladesh to determine the prevalence and associated factors of breakfast skipping by adults. The main objective of this study was to evaluate the eating pattern of breakfast among urban adults in Bangladesh.

METHODOLOGY

A cross-sectional descriptive study design was carried out from April to May, 2013 among urban adults attending in a nutrition counseling center located at Dhaka, Bangladesh. A total number of 426 adults were randomly selected from the center registered for their regular visit. Adults having medical conditions were excluded from the study and adults with normal conditions were included in the study. Equal number of male and female participants were selected for the interview. All of the selected participants were made well informed of the study aims and informed written consent was obtained from the subjects. Interviews were conducted in the counseling room. A semi-structured questionnaire was used to collect data regarding their age, sex, education, weight, height, BMI level, meal pattern, eating pattern of breakfast, skipping of breakfast, reason behind skipping of breakfast, sleeping pattern, presence of health problems etc. Sample completed the questionnaire anonymously and used about 30 minutes to complete the scale. They could decline to participate in the project at any time while completing the questionnaire.

Measures

Data were collected by a self-administered questionnaire. The questionnaire was composed as follow:

Demographic characteristics were age, sex and educational level.

Weight status was determined by Body Mass Index (BMI). The height and weight were measured by self-report and the BMI was calculated by the standard formula: weight (kg) divided by height (m^2). BMI was plotted on the age and sex-specific cutoff points to define the different body sizes of respondents according to nationally accepted guidelines. A BMI greater than or equal to 25 is overweight and a BMI greater than or equal to 30 is obesity. Ranges from 18.5 to 24.9 of BMI ensure the normal level.

Statistical analysis

Crude odds ratios (OR) was calculated to evaluate the risk of independent variables and associated 95% confidence intervals. The risk (odds ratio and chi square) of obesity and associated 95 percent confidence intervals was estimated using simple logistic regression analysis. Multivariable logistic regression modeling was used to control all risk estimates for covariates. Possible covariates, participants' health-promoting behaviors and demographic characteristics, were evaluated as potential confounders of the relationship between eating patterns of breakfast and obesity status. All statistical analyses were performed using SPSS for Windows Version 15.0, with a significance level of $P < 0.05$.

RESULTS

The overall prevalence of skipping breakfast consumption was 35.8%. The prevalence of skipping breakfast consumption in relation to lifestyle habits is shown in Table 1. Skipping breakfast prevalence among female respondents was significantly higher compared to

Table 1: Breakfast skipping prevalence among respondents according to demographic characteristics

Breakfast skipping	**Respondents (%)**
Yes	152(35.8%)
No	274(64.2%)
Breakfast skipping by sex	**Respondents (%)**
Male skipper	60(39.5%)
Female skipper	92(60.5%)
Breakfast skipping by Age group	**Respondents (%)**
20-30	52(34.2%)
31-40	40(26.3%)
41-50	33(21.7%)
51-60	27(17.8%)
Breakfast skipping by Educational status	**Respondents (%)**
Illiterate	45(29.6%)
Primary	34(22.3%)
Secondary	27(17.7%)
Undergraduate	24(15.8%)
>Graduate	22(14.4%)
Breakfast skipping by occupation	**Respondents (%)**
Service holder	77(50.6%)
Housewife	75(49.3%)
Breakfast skipping by weight status	**Respondents (%)**
Underweight	7(1.6%)
Normal weight	192(45%)
Overweight	124(29.2%)
Obesity	103(24.1%)
Reasons of skipping	**Respondents (%)**
Lack of time	98(23%)
Less appetite	168(39.4%)
Unable to prepare	31(7.2%)
Fear of weight gain	60(14%)
Away from family	69(16.4%)

Table 2: Correlation Analysis

Correlations			
	Breakfast consumption	Education Level	Age
Breakfast	1	**0.186**	**0.166**
Education Level	0.186	1	-0.008
Age	0.166	-0.008	1

male respondents (60.5% vs. 39. 5%). The lowest prevalence of skipping breakfast consumption was found among respondents completing their graduation (14.4%). The lowest prevalence of skipping breakfast consumption was also found among respondents aged between 51-60 (17.8%). The main reasons for breakfast skipping were: Less appetite (39.5%), lack of time(16.2%), Fear of weight gain (14%),away from family(16.4%), unable to prepare(7.2%).

Among the considered factors affecting breakfast consumption, education level and age of the respondents have substantial effect. Both of the factors are positively correlated with breakfast consumption though the amount of correlation is weak but surely they have a noticeable influence on the intake of choline level. (Table 2)

Breakfast consumption prevalence among respondents with good self-perception about appetite was significantly higher than for respondents with bad self-perception (44% vs. 26%).(Table 3) It was also 2 times(OR 1.8; CI 1.2-2.9) higher among respondents with good self-perception about sleeping quality

Table 3: Respondents self perception of breakfast consumption associated factors category

Physical condition (n=426)	n	%
Good	182	42.7%
Medium	127	29.8%
Bad	117	27.4%
Appetite (n=426)	n	%
Good	187	44%
Medium	128	30%
Bad	111	26%
Sleeping (n=426)	n	%
Good	198	46.5%
Medium	125	29.3%
Bad	103	24.2%.

Table 4: Logistic regression analysis of regular breakfast consumption among respondents

Category	**OR**	**95%CL**	**P**
Gender (n=426)			<0.01
Male	0.43	reference	
Female	1.00	0.38-0.48	
Physical condition (n=426)			<0.01
Good	1.00	reference	
Medium	0.67	0.62-0.78	
Bad	0.55	0.41-0.74	
Marital Status(n=426)			0.22
Married	1.00	reference	
Unmarried	0.85	0.76-0.396	
Appetite (n=426)			<0.01
Good	1.00	reference	
Medium	0.54	0.48-0.61	
Bad	0.29	0.23-0.37	
Sleeping (n=426)			<0.01
Good	1.00	reference	
Medium	0.67	0.59-0.75	
Bad	0.44	0.36-0.53	
Occupation(n=426)			<0.01
Housewife	1.00	reference	
Service holder	0.73	0.65-0.82	

compared to respondents with bad self-perception about sleep.(Table 4) The prevalence of eating breakfast regularly in respondents having good self-perception about sleeping quality was significantly higher than respondents with bad self-perception about sleeping quality (46.5% vs. 24.2%). (Table 3) It was also over 3 times(OR 3.2; CI 2.04-5.13) higher among respondents with good self-perception about sleeping quality compared to respondents with bad self-perception about sleep.(Table 4)

DISCUSSION

The results of the current study support the hypothesis that breakfast skipping is more prevalent among urban adults of Bangladesh. The overall prevalence of breakfast skipping was estimated as 35.8% by urban adults of Bangladesh. A number of studies have looked at the prevalence of skipping breakfast. Several studies showed that the prevalence of breakfast skipping, among Louisiana (France) adult was higher than in other countries. A Cross-sectional survey (Nicklas et_al., 1998) of young adults in Bogalusa, La showed the prevalence of breakfast skipping with 37% where Nicklas et al., 1998 and Shaw, Mary, 1998 reported that 19% of American and 12% of Australian young people skipped breakfast. In this study the prevalence of breakfast skipping among adult population of Bangladesh is also in high with 35.8% which was close to the result of the study on France adults (Nicklas et al., 1998). Another study (Deshmukh-Taskar et al., 2010) showed the prevalence of breakfast skipping among adolescents with 31.5% where present result reports the prevalence with 35.8%. Another study showed the prevalence of br-eakfast skipping with 22% (Wyatt et al., 2002) where

a high prevalence was also observed in this study.

Female respondents (60.5%) skipped breakfast more(OR 95% CI: 1.9; 0.90-4.13) compared to their male respondents (39.5%) in this study. Similarly, another study (Shaw, Mary E. 1998) showed that female respondents skipped breakfast more compared to their male respondents. But a contradictory result was found in a cross-sectional survey conducted among medical students in the Inner Mongolia Medical College showed the prevalence of skipping breakfast with 41.7% and 23.5% for males and females, respectively (Juan Sun et al., 2013)**.**

In this study it was reported by skippers that the main reasons for skipping were: habit (39.5%), work pressure (23.2%), lack of time (16.2%), away from family (14%), unable to prepare (7.7%). Similarly, Singleton and Rhoads (1982**)** found that the most common reasons given for skipping were no time (43%) and not being hungry or habit of skipping (42%); less common reasons included being on a diet to lose weight, not feeling good, no one to prepare food, not liking the food served, and food not being available. Lack of time and habit privilege the reason behind breakfast skipping most often.

In this study, having less appetite or habit (39.4%) was considered as most influential factors in breakfast skipping where Singleton and Rhoads (1982) also found the similar result with 42%. Many people on a diet make the erroneous assumption that skipping breakfast would help them weight loss , but studies offered ample evidence that fasting made people hungrier and increased the appeal of high calorie foods and the amount people ate leading weight gain. Several studies including Stockman et al., 2005 and Berkey et al**.,** 2003 have yielded results, showing that inconsistent or irregular breakfast eating was significantly associated with being overweight. In one study, increased meal frequency (meals per week) was associated with a 45% reduced risk for obesity (odds ratio = 0.55 (95% CI = 0.33, 0.91)) in adults (Ma et al., 2003)**,** whereas skipping breakfast appeared to be associated with a significant increase in risk of developing obesity (Cho S,et al., 2003**).** In a study (Huang et al., 2010), the unadjusted odds ratio of obesity in breakfast skippers was 1.23 (95% CI: 1.06, 1.43)

This study only evaluated the prevalence of breakfast skipping and its associated factors in Bangladeshi adults. Considering this issue, the next step of this study will be to follow up respondents for a period of time to evaluate the adverse health outcome associated with breakfast skipping.

The study has several limitations and this influence the generalizability of the findings. First, since the data were collected through a self-reporting measure, it is possible that the findings were affected by a social desirability response set and the study is cross-sectional which does not infer causal relationships Second, breakfast eating was only counted from Monday to Friday; seven-day measurements or in-depth interviews might increase the reliability and validity of our understanding of this phenomenon. Third, we did not explore the content or quality of breakfast. Furthermore, we examined only one district located in Bangladesh, caution should be taken to generalize the data for other district outside Dhaka city.

CONCLUSION

Breakfast skipping was associated with many factors, most importantly gender, appetite and psychological and physical condition. The prevalence of skipping breakfast is significantly higher compared recently reported figures for adults in western countries and other developing countries. This study provides evidence of increasing trend of breakfast skipping in adults of Bangladesh. Considering such a high prevalence of breakfast skipping in urban adults, these findings can provide baseline data for taking the initiative to monitor and make people aware regarding the importance of breakfast eating.

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