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Body Weight and Length of Residence in the US Among Chinese Americans

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Abstract

Background—It has been shown that as immigrants' length of residence increases, so does their weight. However, little is known about factors associated with weight status among Chinese Americans, one of the fastest growing immigrant populations in the US.

Methods—Baseline data from a National Cancer Institute-funded longitudinal study involving a multi-stage probability sample of Chinese Americans residing in two communities in New York City were collected.

Results—Chinese Americans had a low BMI (mean = 22.81) and a lower proportion of obese individuals compared with other ethnic groups in the US reported in the literature. While the

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prevalence of being overweight (21%) and obese (2%) was low, length of residence was positively associated with weight status ($P < 0.005$).

Conclusions—Innovative strategies to help Chinese Americans maintain healthy weight status and to prevent them from becoming overweight and obese are needed.

Keywords

Body weight; Body mass index (BMI); Length of residence; Chinese American; Acculturation

Introduction

Asian American/Pacific Islanders (AAPI) are one of the fastest growing immigrant populations in the US in recent years [1]. According to the 2000 Census data, more than half (51%) of the Asian population lived in just three states: California, New York, and Hawaii. Asian Americans mainly resided in coastal and/or urban metropolitan areas. Moreover, with a population of 2.7 million, Chinese Americans represented the largest Asian subgroup in the US [1]. In major cities such as New York City, Chinese Americans constitute the single largest Asian subgroup [2].

Chinese generally have a low prevalence of being overweight and/or obese. For example, according to recent results from a nationally representative sample of over 15,000 Chinese adults, the mean BMI and obesity prevalence for men were 23.1 kg/m^2 and 2.8%, respectively, and 23.5 kg/m^2 and 5.0%, respectively, for women [3]. However, there is evidence to suggest that changes in socioeconomic conditions and urbanization in China have resulted in a rapid rise in obesity levels [4, 5].

Extant literature has suggested that immigrants, in general, have a healthier body weight than the US-born population. For example, according to a study using data from the 2000 National Health Interview Survey found that 16% of immigrants compared with 22% of US-born individuals surveyed were obese [6]. However, as immigrants' length of residence increases, so does their weight [6–9]. Prior literature has shown that the prevalence of obesity among immigrants who had lived in the US for at least 15 years approached that of US-born adults [6].

Potential factors that are associated with obesity, such as diet, physical activity, lifestyle, body image, and acculturation have rarely been examined in AAPI populations [10]. Literature on beliefs and attitudes related to obesity risk and its prevention in Chinese Americans is even rarer [11].

With the prevalence of obesity reaching epidemic proportions in various ethnic/racial populations in the US [12], it is important to examine the magnitude of change in weight status, and the effect of the length of residence on BMI among Chinese Americans, a group that has not been studied extensively. The aim of this paper is twofold: (1) to assess the weight status of a representative sample of Chinese American adults living in New York City, and (2) to determine the association between length of residence, acculturation and weight status among this group.

Methods

Study Design

The study design was cross-sectional, and used baseline data collected from a multi-stage probability sample of Chinese Americans residing in two communities in New York City: Flushing, Queens, and Sunset Park, Brooklyn. This is the largest probability-based sample of Chinese Americans focused on health in the US with 2,537 participants aged 18–75 years.

Data Sources and Sample Selection

A detailed description of the data source and sample selection methods is reported elsewhere [13, 14]. Briefly, eligible households were obtained from the Flushing and Sunset Park white pages, using a list of 867 unique Chinese surname spellings identified in consultation with Chinese linguists. A stratified systematic sampling procedure was applied by zip code to list all households, resulting in a sample frame of households representative of each community. Individuals within households were selected as eligible sample participants. Sample data were weighted to account for unequal probabilities of sample selection and non-response.

Trained bilingual interviewers conducted interviews in English, Mandarin, Cantonese, Fukinese, and other dialects. Of the 2,537 surveys conducted, approximately 77% of the questionnaires (n = 1,955) were completed as in-person household-based interviews, and 23% were done by telephone. The change in survey mode from in-person to telephone was tested in the analysis and had an insignificant effect on the results.

Questionnaire

The questionnaire development was informed by focus group results. Questions were adapted from validated national health and tobacco survey instruments. The final survey was translated into Chinese, back-translated, and pilot-tested to account for any inconsistencies. The 110-item survey gathered information on health status, access to care, chronic conditions, and other health indicators including physical activity, self-reported weight and height, tobacco use, and alcohol consumption.

Data Analyses

Data were analyzed using STATA version 8.0 [15]. After excluding participants with missing weight or height values, data from 2,342 participants were used in this analysis. ANOVA, t-test, and chi-square statistics were used to detect statistical significance ($P < 0.05$).

Results

The overall mean body mass index (BMI = kg/m^2) was 22.81 (see Table 1). Older participants and those who had a lower educational level had a significantly higher BMI than individuals who were younger and had more education ($P < 0.005$). These results were observed among the women only. Regarding the relationship between marital status and BMI, the results demonstrated that married participants compared with unmarried participants had a significantly higher BMI. This held true for both men and women. Moreover, relative to participants who had lived in the US 5 years or less, those who had

lived in the US for 16 years or longer had a significantly higher BMI. In contrast, respondents who were more acculturated than those who were less acculturated, assessed by two categorical variables regarding English language and media usage, had a significantly lower BMI ($P < 0.005$).

Table 2 reports the distribution of various acculturation indicators by BMI status. Chi-square tests showed that a higher proportion of participants who had lived in the US for a longer period of time had a higher weight status ($P < 0.001$). In addition, Table 2 shows that 2.43% of the participants were obese while 7.13% were underweight.

Discussion

The study results revealed the following major findings: (1) Chinese Americans had a low BMI and a lower proportion of obese individuals compared with other ethnic groups in the US, as reported in the literature, (2) length of residence in the US was positively correlated with BMI status, (3) acculturation, assessed by language and media usage, was inversely associated with BMI, and (4) married versus unmarried respondents had a higher BMI.

In a recent study that included a nationally representative sample of immigrants living in the US, foreign-born Asians were found to have the lowest overweight (25%) and obesity (7%) rates [3]. Lauderdale and colleagues using national data on Asian Americans found that Chinese Americans compared with Japanese, Filipino, or Indian Americans had the lowest BMI values [8]. Furthermore, the results from this study revealed that 21% of individuals were overweight and 2% were obese, which is strikingly similar to results from a recent nationally representative sample of Chinese in China (20% and 3% of the sample were overweight and obese, respectively) [16], suggesting Chinese Americans in New York City have managed to maintain a weight status comparable to that of their native counterparts.

There are several possible explanations as to why this Chinese American population seems to be able to prevent weight gain while residing in the US. First, the traditional Chinese diet is high in fruits and vegetables and low in fats. Prior literature has shown that Chinese adults, after immigrating to the US, may have adopted Western-eating habits while maintaining their Chinese dietary habits [17]. Indeed, one study has shown that Chinese Americans have retained some core traditional foods such as grains, fruits, and vegetables, but have also incorporated some “typical” American foods such as dairy products [18]. As a result, they were able to keep eating relatively healthy foods and maintain their weight. Second, the study participants were recruited from a large urban area, New York City, that may offer several advantages for healthy eating and weight maintenance, including (1) easy access to a variety of healthy foods, (2) greater availability of foods that they used to consume in their home counties, and (3) more opportunities for physical activity, such as walking [19].

Prior studies have shown that adopting US norms and culture could lead to large increases in body weight status among immigrants [20, 21]. Recent data from focus groups exploring the beliefs and attitudes of Chinese Americans concerning obesity risk and its prevention found that although participants viewed traditional Chinese cuisine as healthier, they still

consumed less traditional foods as they became more accustomed to the American lifestyle [11]. In addition, physical and social environmental factors such as the proliferation of fast food restaurants, larger portions of food served in restaurants, and pressure from peers to eat unhealthy foods, such as french fries, were reported to be major causes of obesity in Chinese Americans [11]. Elucidating the mechanisms that traditional Chinese cultural beliefs and practices provide as a buffer against becoming overweight and/or obese is greatly needed [5].

It has been shown that the longer an immigrant resides in the US, the greater the risk of becoming overweight and/or obese [6–9, 20, 22]. It has been suggested that the association between length of residence and the high risk of obesity may be in part due to the adoption of unhealthy behaviors, such as poor dietary patterns and a sedentary lifestyle that is more typical of the host country [23]. Results from this study, despite the observed low overweight and obesity rates, also support this association and are in agreement with findings from other studies that include Asian American immigrants [6, 8]. These results strongly suggest that length of residence is a key contributing factor to becoming overweight and obese among immigrant populations in the US.

Prior literature has indicated that acculturation to the US environment over time may lead to an increase in weight status [24–26]. The current study, on the contrary, showed an inverse association between BMI and acculturation. This may be due to the way acculturation was defined: two categorical variables regarding English language and media use [13]. The use of English language and media may be an indicator of higher educational attainment and socio-economic status (SES), both of which have been associated with a lower body weight [27–29]. More research on appropriate acculturation measures is needed.

Finally, researchers have long documented the protective nature of marriage on health status. For example, Gove [30] argues that the reported better health status among married individuals can, in part, be attributed to the psychosocial benefits of marriage. Prior literature has indeed shown that married compared with unmarried individuals are generally happier and report good health status [31, 32]. However, the current study reported that being married is associated with significantly higher weight status. The protective effects of marriage in terms of weight management among immigrants who are generally not overweight or obese deserve further investigation.

In conclusion, this study showed low proportions of Chinese Americans who are overweight or obese at present; however, with an increasing number of Chinese immigrants and an expected longer duration of residence in the US, the prevalence of overweight and obesity levels may increase in the future. Innovative strategies to help maintain healthy weight status and to prevent individuals from becoming overweight and obese are needed for this population.

References

1. Barnes, JS.; Bennet, CE. Census 2000 Brief. Washington, DC: 2002. The Asian population: 2000.
2. US Census Bureau. [Accessed 1 Mar 2006] Fact sheet. http://www.factfinder.census.gov

3. Reynolds K, Gu D, Whelton PK, Wu X, Duan X, Mo J, He J. InterASIA collaborative group. Prevalence and risk factors of overweight and obesity in China. Obesity (Silver Spring). 2007; 15:10–8. [PubMed: 17228026]

4. Zhai F, Wang H, Du S, He Y, Wang Z, Ge K, Popkin BM. Lifespan nutrition and changing socio-economic conditions in China. Asia Pac J Clin Nutr. 2007; 16(Suppl 1):374–82. [PubMed: 17392135]

5. Johnson CA, Xie B, Liu C, Reynolds KD, Chou CP, Koprowski C, Gallaher P, Spruitj-Metz D, Guo Q, Sun P, Gong J, Palmer P. Socio-demographic and cultural comparison of overweight and obesity risk and prevalence in adolescents in Southern California and Wuhan China. J Adolesc Health. 2006; 39:925e1–8.

6. Goel MS, McCarthy EP, Phillips RS, Wee CC. Obesity among US immigrant subgroups by duration of residence. JAMA. 2004; 292:2860–7. [PubMed: 15598917]

7. Kaplan MS, Huguet N, Newsom JT, McFarland BH. The association between length of residence and obesity among Hispanic immigrants. Am J Prev Med. 2004; 27:323–6. [PubMed: 15488363]

8. Lauderdale DS, Rathouz PJ. Body mass index in a US national sample of Asian Americans: effects of nativity, years since immigration and socioeconomic status. Int J Obes Relat Metab Disord. 2000; 24:1188–94. [PubMed: 11033989]

9. Singh GK, Siahpush M. Ethnic-immigrant differentials in health behaviors, morbidity, and cause-specific mortality in the United States: an analysis of two national databases. Hum Biol. 2002; 74:83–109. [PubMed: 11931581]

10. Davis J, Busch J, Hammatt Z, Novotny R, Harrigan R, Grandinetti A, Easa D. The relationship between ethnicity and obesity in Asian and Pacific Islander populations: a literature review. Ethn Dis. 2004; 14:111–8. [PubMed: 15002930]

11. Liou D, Bauer KD. Exploratory investigation of obesity risk and prevention in Chinese Americans. J Nutr Educ Behav. 2007; 39:134–41. [PubMed: 17493563]

12. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999–2002. JAMA. 2004; 291:2847–50. [PubMed: 15199035]

13. Shelley D, Fahs M, Scheinmann R, Swain S, Qu J, Burton D. Acculturation and tobacco use among Chinese Americans. Am J Public Health. 2004; 94:300–7. [PubMed: 14759946]

14. Shelley D, Fahs MC, Yerneni R, Qu J, Burton D. Correlates of household smoking bans among Chinese Americans. Nicotine Tob Res. 2006; 8:103–12. [PubMed: 16497604]

15. StataCorp. Stata Statistical Software: Release 8.0. College Station, TX: Stata Corporation; 2003.

16. Gu D, He J, Duan X, Reynolds K, Wu X, Chen J, Huang G, Chen CS, Whelton PK. Body weight and mortality among men and women in China. JAMA. 2006; 295:776–83. [PubMed: 16478900]

17. Koo LC. The use of food to treat and prevent disease in Chinese culture. Soc Sci Med. 1984; 18:757–66. [PubMed: 6729536]

18. Lv N, Cason KL. Dietary pattern change and acculturation of Chinese Americans in Pennsylvania. J Am Diet Assoc. 2004; 104:771–8. [PubMed: 15127063]

19. Yeh, MC.; Katz, DL. Food, nutrition and the health of urban populations. In: Freudenberg, N.; Galea, S.; Vlahov, D., editors. Cities and the health of the public. Nashville: Vanderbilt University Press; 2006. p. 106-125.

20. Gordon-Larsen P, Harris KM, Ward DS, Popkin BM. Acculturation, overweight-related behaviors among Hispanic immigrants to the US: the National Longitudinal Study of Adolescent Health. Soc Sci Med. 2003; 57:2023–34. [PubMed: 14512234]

21. Sundquist J, Winkleby M. Country of birth, acculturation status and abdominal obesity in a national sample of Mexican-American women and men. Int J Epidemiol. 2000; 29:470–7. [PubMed: 10869319]

22. Himmelgreen DA, Perez-Escamilla R, Martinez D, Bretnall A, Eells B, Peng Y, Bermudez A. The longer you stay, the bigger you get: length of time and language use in the US are associated with obesity in Puerto Rican women. Am J Phys Anthropol. 2004; 125:90–6. [PubMed: 15293335]

23. Neuhouser ML, Thompson B, Coronado GD, Solomon CC. Higher fat intake and lower fruit and vegetables intakes are associated with greater acculturation among Mexicans living in Washington State. J Am Diet Assoc. 2004; 104:51–7. [PubMed: 14702584]

24. Aldrich L. Acculturation erodes the diet quality of US. Hisp Food Rev. 2000; 23:51–5.
25. Lee S, Sobal J, Frongillo EA. Acculturation and health among Korean Americans. Soc Sci Med. 2000; 51:159–73. [PubMed: 10832565]
26. Magana JR, de la Rocha O. Revisiting the dimensions of acculturation: cultural theory and psychometric practice. Hisp J Behav Sci. 1996; 18:444–69.
27. Sobal J, Stunkard AJ. Socioeconomic status and obesity: a review of the literature. Psychol Bull. 1989; 105:260–75. [PubMed: 2648443]
28. Sundquist J, Johansson SE. The influence of socioeconomic status, ethnicity and lifestyle on body mass index in a longitudinal study. Int J Epidemiol. 1998; 27:57–63. [PubMed: 9563694]
29. Paeratakul S, Lovejoy JC, Ryan DH, Bray GA. The relation of gender, race and socioeconomic status to obesity and obesity comorbidities in a sample of US adults. Int J Obes Relat Metab Disord. 2002; 26:1205–10. [PubMed: 12187397]
30. Gove W. Sex, marital status, and mortality. Am J Sociol. 1973; 79:45–68. [PubMed: 4740470]
31. Kawachi, I.; Kennedy, BP. The health of nations. New York: The New Press; 2003.
32. Lane RE. Friendship or commodities? The road not taken: friendship, consumerism, and happiness. Critical Rev. 1994; 8:521–54.

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Table 1

Mean body mass index (BMI) by demographic characteristics of study population[a]

Characteristics	All sample (*n* = 2,342)			Men (*n* = 1,450)			Women (*n* = 892)		
	n	**%**	**Mean BMI**	***n***	**%**	**Mean BMI**	***n***	**%**	**Mean BMI**
Overall			22.81	–	–	–	–	–	–
Gender				–	–	–	–	–	–
Men	1450	55	23.41**						
Women	892	45	22.08						
Age (years)									
18–34	580	32	21.95	358	32.11	22.96	222	31.87	20.69
35–44	648	25.31	23.10	385	24.61	23.74	263	26.18	22.39
45–54	598	23.65	23.18	376	23.55	23.45	222	23.76	22.87
≥55	459	19.04	23.38**	293	19.73	23.57	166	18.19	23.14**
Education									
< 12 years	945	41.76	23.22**	572	39.19	23.42	373	44.92	23.01**
Complete hs	528	23.21	22.65	311	23.07	23.53	217	23.39	21.61
>12 years	858	35.03	22.41	561	37.74	23.31	297	31.69	21.18
Marital status									
Not married	445	22.3	22.04	324	25.99	22.51	121	17.78	21.18
Married	1889	77.7	23.05**	1120	74.01	23.75*	769	82.22	22.29*
Employment									
Yes	1636	66.73	22.89	1112	74.65	23.55	524	57.04	21.87
No	680	33.27	22.66**	317	25.3	23.35	363	42.96	22.36*
Country of birth									
China	1890	79.67	22.68	1169	79.95	23.22	721	79.34	22.04
Taiwan	124	4.04	23.07	65	3.33	24.57	59	4.19	21.97
Hong Kong	180	9.67	23.07	115	9.52	23.99	65	9.85	21.94
US	57	3.01	24.27	45	3.72	24.86	12	2.15	23.11
Other	87	3.61	23.15	53	3.49	23.32	34	3.75	22.95
Income									

Characteristics	All sample (*n* = 2,342)			Men (*n* = 1,450)			Women (*n* = 892)		
	n	**%**	**Mean BMI**	***n***	**%**	**Mean BMI**	***n***	**%**	**Mean BMI**
< $10,000	304	14.78	22.95	171	12.99	22.99	133	17.09	22.92
$10,000–20,000	604	34.82	22.86	374	33.20	23.06	230	36.89	22.63**
$20,000–40,000	585	27.37	22.69	388	30.26	23.53	197	23.93	21.39
>$40,000	475	23.03	22.88	304	23.75	23.83	171	22.10	21.59
Acculturated[b]									
Yes	522	22.23	22.25	346	22.97	23.03	176	21.34	21.24
No	1820	77.77	22.97**	1104	77.03	23.53	716	78.66	22.31*
Length of stay (years)									
≤5	434	19.89	22.12	245	17.92	22.34	189	22.26	21.92
6–15	1071	48.83	22.69	662	49.43	23.56	409	48.1	21.62
≥16	656	31.28	23.39**	422	32.65	23.66	234	29.64	23.04*

[a] Proportions have been calculated using probability weights assigned to respondents to account for unequal probabilities of sample selection and non-response

[b] Acculturated is a composite of two categorical variables regarding language and media: speaks English in the home or reads English newspapers most of all days

* $P < 0.05$;

** $P < 0.005$

Table 2

Distribution of acculturation characteristics by BMI status[a]

Acculturation characteristics	BMI (kg/m^2)							
	< 18.5 Underweight		18.5 to < 25 Normal weight		25 to < 30 Overweight		≥30 Obese	
	n	%	*n*	%	*n*	%	*n*	%
Speaks English at home								
Yes	16	8.01	208	74.30	58	16.55	4	1.15
No	148	7.01	1422	68.83	435	21.55	51	2.61
English fluency								
Person in home fluent in English	86	6.53	917	69.00	294	22.08	29	2.39
No person in home fluent in English	57	6.58	522	69.88	144	22.80	20	2.74
Year of residence in the US[*]								
≤5	40	9.19	309	73.03	78	16.29	7	1.48
6–15	77	7.84	791	73.53	183	16.32	20	2.32
≥16	34	4.72	413	62.38	183	29.15	26	3.75
Language media preferred								
Chinese media only								
No	120	7.90	1131	69.53	342	20.39	35	2.18
Yes	44	5.30	499	69.41	151	22.24	20	3.04
English media only								
No	157	7.24	1551	69.69	466	20.55	54	2.52
Yes	7	5.13	79	65.96	27	28.05	1	0.86
Acculturated[b]								
No	128	6.76	1249	68.44	396	22.00	47	2.79
Yes	36	8.43	381	73.18	97	17.22	8	1.17
Overall sample (n = 2,342)	163	7.13	1630	69.49	493	20.94	55	2.43

[a] Proportions have been calculated using probability weights assigned to respondents to account for unequal probabilities of sample selection and non-response

[b] Acculturated is a composite of two categorical variables regarding language and media: speaks English in the home or reads English newspapers most of all days

[*] Chi-square, $P < 0.001$