



Fast Food Restaurant Density and Weight Status: A Spatial Analysis among Filipina Migrant Workers in Macao (SAR), People's Republic of China

Lei Huang¹, Grace Yi^{1,2}, Carl Latkin³, Brian J. Hall^{1,3}

¹ Global and Community Mental Health Research Group, Faculty of Social Sciences, The University of Macau, Macao (SAR), People's Republic of China

² Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

³ Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

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ABSTRACT

Female migrant populations are at high risk of being overweight or obese. Sociodemographic and spatial correlates for overweight and obesity among female transnational migrant populations remain unexplored. This study examined sociodemographic and spatial correlates of unhealthy weight status among female Filipino domestic workers in Macao (SAR), China. Data were collected from 1,388 female Filipino domestic workers recruited using respondent-driven sampling between November, 2016 to August, 2017. Self-reported data on demographic characteristics, residential mailing address, and health-related behaviors were collected using tablet devices. Height, weight, and body fat percentage were objectively measured at the study site. Nearly 65% of participants were classified as being overweight or obese, with 25% overweight and 39% obese. Adjusted multivariable logistic regression indicated that increased fast food restaurant density within a 0.5-mile buffer zone around a residential address was positively associated with higher odds of being overweight and obese (aOR = 1.07; 95% CI [1.01 – 1.14]). Adjusted multivariable linear regression indicated that higher fast food restaurant density within the neighborhood of residence was positively associated with body fat percentage ($\beta = .08$, $p < .001$). Increased fast food restaurant density was associated with unhealthy weight status among female domestic workers in Macao (SAR), China. Health promotion interventions to improve diet and physical activity are indicated for this population.

BACKGROUND

- Overweight and obesity is a worldwide public health problem associated with increased risk of cardiovascular and other non-communicable disease morbidity and mortality (GBD 2015 Obesity Collaborators et al., 2017).
- The latest global estimates for overweight and obesity among adults is 39% and 13% respectively (World Health Organization, 2018).
- Migrant populations from low- or middle-income regions to high-income regions are at higher risk of being overweight and obese compared to their counterparts back home and general population in the host region (Agyemang et al., 2009; Daryani et al., 2005; Toselli et al., 2014).
- Other than individual factors such as age, dietary change, physical activity, and level of acculturation, migrant populations are constantly exposed to their neighbourhood food environment, which may not offer healthy options.
- The availability of low-cost, high-calorie food in neighbourhoods was associated with higher Body Mass Index (BMI), and this association was stronger among those with low socioeconomic status (Hollands et al., 2013; Jilcott et al., 2011; Li et al., 2009)
- The Philippines is the source of an estimated 2.3 million transnational migrant workers (Philippine Statistics Authority, 2018). They commonly work in Macao (SAR), Hong Kong (SAR), and within the Greater Bay Area of China (DSAL, 2018).
- At the end of 2018, there were more than 15,000 Filipino domestic workers in Macao (DSAL, 2018). They tend to work long hours in order to repay agency fees and send remittances home (Hall, Garabiles, & Latkin, 2019).
- For Filipino domestic workers in Macao, Western-style fast food might be a popular food choice given its similarity to regular dietary choices at home. Fast food might also serve as a cheap and quick food source for them given the financial and time constraints they experience while working in Macao.
- Exploring the neighbourhood food environment is relevant to understanding whether exposure to Western fast food is a potential source of unhealthy weight status in Macao.

OBJECTIVES

The current study aimed to evaluate known correlates, with a special focus on spatial correlates, among adult female Filipina transnational migrant domestic workers in Macao. The associations between fast food restaurant density and objectively measured BMI and body fat percentage were examined. The proposed hypotheses of this study are as follows:

- Proximity to Western fast food restaurant exposure would be associated with higher odds of being overweight or obese.
- Proximity to Western fast food restaurant exposure would be associated with higher body fat percentage.

METHODS

- Participant Selection Criteria:
 - Female aged 18 or older
 - Lives and works in Macao as domestic worker
 - With valid working visa or a residence ID card of Macao
- Data Collection:
 - Respondent Driven Sampling (RDS) (Salganik & Heckathorn, 2004)
 - Electronic survey data collection (Qualtrics) at designated study site
 - Anthropometric measurements in a private area at designated study site
- Measures:
 - Weight status
 - BMI
 - Body fat percentage
 - Exposure to fast food restaurants
 - Fast food restaurant density within neighborhood
 - Fast food restaurant density within 0.25- and 0.50-mile buffer zone
 - Physical activity
 - Godin Leisure-Time Exercise Questionnaire (Shephard, 1997)
 - Demographic characteristics

RESULTS

FFR Density	BMI				Body Fat Percentage				
	B	SE	OR (95% C.I.)	p	B	SE	β	F	p
Within neighborhood	0.041	0.061	1.041 (0.924, 1.173)	0.505	0.283	0.136	0.062	4.36	0.037*
Within 0.25-mile buffer	0.042	0.058	1.043 (0.921, 1.168)	0.465	-0.025	0.131	-0.006	0.04	0.851
Within 0.5-mile buffer	0.063	0.030	1.065 (1.004, 1.129)	0.033*	0.031	0.068	0.014	0.22	0.643

Note. FFR = Fast food restaurant. * $p < .05$. ** $p < .01$. *** $p < .001$.

	B	SE	aOR (95% C.I.)	p		B	SE	β	p
Age	0.049	0.008	1.050 (1.034-1.067)	0.000***	Age	0.184	0.16	0.353	0.000***
Marital status					Marital status				
Married	-0.134	0.164	0.874 (0.634-1.205)	0.411	Married	-0.657	0.339	-0.069	0.053
Partnered	0.006	0.264	1.006 (0.600-1.687)	0.981	Partnered	0.559	0.553	0.031	0.313
Separated	-0.159	0.214	0.853 (0.561-1.297)	0.458	Separated	-0.148	0.441	-0.011	0.737
Widowed	-0.230	0.295	0.795 (0.446-1.417)	0.437	Widowed	0.091	0.587	0.005	0.877
Months of work as a domestic worker in Macao	0.002	0.001	1.002 (1.001-1.003)	0.006**	Months of work as a domestic worker in Macao	0.002	0.001	0.035	0.221
Residency status					Residency status				
Stay-out	0.108	0.137	1.114 (0.852-1.457)	0.430	Stay-out	0.528	0.274	0.056	0.054
Monthly salary	0.000	0.000	1.000 (1.000-1.000)	0.362	Monthly salary	0.000	0.000	0.006	0.835
Being in debt					Being in debt				
Yes	0.121	0.129	1.128 (0.876-1.452)	0.394	Yes	0.633	0.265	0.067	0.017*
Hours of work per week	-0.004	0.003	0.996 (0.991-1.002)	0.208	Hours of work per week	-0.007	0.006	-0.034	0.233
Frequency of eating at the table with employer					Frequency of eating at the table with employer				
Weekly	-0.003	0.240	0.997 (0.623-1.597)	0.991	Weekly	0.349	0.499	0.02	0.485
Monthly	-0.138	0.259	0.871 (0.524-1.446)	0.593	Monthly	-0.343	0.543	-0.018	0.528
Never	-0.103	0.147	0.902 (0.676-1.204)	0.485	Never	-0.46	0.304	-0.044	0.131
Weekly leisure activity	0.003	0.002	1.003 (0.999, 1.008)	0.123	Weekly leisure activity	0.001	0.004	0.005	0.867
Weekly frequency of working up a sweat					Weekly frequency of working up a sweat				
Often	-0.347	0.172	0.707 (0.504-0.991)	0.044*	Often	-0.767	0.363	-0.06	0.035*
Fast food restaurant density	0.065	0.032	1.067 (1.003-1.136)	0.040*	Fast food restaurant density	0.366	0.128	0.08	0.004**

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

CONCLUSION

- More than half the Filipino domestic workers in this study were either overweight (25%) or obese (39%), which is a critical health issue for this population.
- Higher fast food restaurant density was associated with higher odds of overweight or obesity and higher body fat percentage.
- Working up a sweat during leisure time exercise was associated with lower odds of being overweight or obese and lower body fat percentage, which supports the importance of rigorous exercise in maintaining a healthy weight status.
- Exercise and lifestyle programs that are designed to promote healthy diet and exercise that are tailored to meet the schedules of domestic workers are urgently needed.

Email correspondence should be directed to:
Lei Huang: rebecca.leihuang@gmail.com
Dr. Brian J. Hall: brianhall@um.edu.mo