Background

- Obesity and being overweight are significant health problems in all over the world. The percentage of the population in the United States and South Korea that is obese has increased significantly during past several decades. 34% of Mississippi adult population is obese based on data from National Health and Nutrition Examination Survey (NHANES)3 and 24.5% of Korea population is obese based on data from the Korea Community Health Survey.4 Mississippi selected as comparison population since two regions have similar sample size and Mississippi is the state that overall obesity rate is highest among United States.

- According to Lalonde, lifestyle explains individuals’ health outcome the most(50%). 5 Also, individual lifestyle can be confounded by environment. Bronfenbrenner’s Ecological Framework for Human Development supports Lalonde’s idea that how an individual can be increased significantly during past several decades. 6

- There was no food accessibility and individuals’ obesity status study in Korea. Furthermore, there were no food accessibility and BMI studies comparing two different countries. This study is conducted to study the effect of the number of fast-food restaurant in district on individuals’ BMI status in Republic of Korea and its result will be compared to Mississippi, United States.

Methods

- Data
  The 2012 Fifth Korea National Health and Nutrition Examination Survey (KNHANES V-3)9 and 2011 Behavioral Risk Factor Surveillance Survey (BRFSS) 8 are used for measuring individual variables.
  - 8,058 samples were analyzed in the South Korea study while 7,226 were analyzed in the Mississippi study.
  - There are 16 regional districts in Korea and 9 public health districts in Mississippi. Major four fast-food restaurants; Lotteria, McDonalds, KFC and Burger King are analyzed for the number of fast-food restaurant in South Korea while limited-service restaurants in Mississippi used for analyzing the number of fast-food restaurant in Mississippi.7

- Variables
  - Dependent: Body Mass Index (BMI) is the best proxy for body fat percentage among ratios of weight and height and used for outcome variable.
  - Independent: Sex, age, income level, education level, race, perception of general health status, days of bad mental health in a month, whether individuals exercised during past month or not, frequency of drinking and current smoking status are used as predictors.11

- Analysis
  - Statistical software SAS was used to construct Multilevel (level2) mixed-effect linear regression model.
  - Group-centered means were used for all the variables in order to see only 1 level effects.
  - Effects of individual predictors, age, race, sex, income level, education level, perception about general health status, mental health status, exercise, drinking and smoking habit, on individuals’ BMI and district differences in BMI studied.

Results

- There were insignificant predictors in each model, but insignificant models were kept in the final model since this study wanted to examine all the variables in the within-between model.
- Republic of Korea
  - Study, sex, age and exercise were significant predictors for BMI. 
The number of four major fast-food restaurants where people live was not significant factor affecting individuals’ BMI.
- Mississippi, United States
  - Study, age, race, general health status, exercise habit and smoking status were significant predictors of individuals’ BMI.
  - The number of limited-service restaurant in a district was not a significant factor affecting individuals’ BMI.

Conclusions

- There are different variables affecting individuals’ BMI in both studies. However, no district differences were discovered in individuals’ BMI and there was no effect from the number of fast-food restaurants on individuals’ BMI in both studies.
- Based on the results, we can conclude that weight problems in Republic of Korea and Mississippi are related with individual factors rather than districts and accessibility to fast-food restaurant in each district.
- There are several limitations in this study. The number of districts (level2) are too small for multilevel analysis and district area is too large for measuring individuals’ food accessibility. Also, two studies are not appropriately compared. Characteristics of samples are too much different. Two studies used different individual variables and way to measure fast-food restaurant is different. Furthermore, some questions used in this study are not exactly represent the variables (mental health, exercise and smoking).
- This study shows that weight problems in Republic of Korea and Mississippi are related to personal health habits rather than fast-food availability. Republic of Korea and Mississippi need to enforce policies focusing on individuals rather than food environment to drop the dubious honor of being the state with the highest prevalence of unhealthy high BMI.

References

- The number of limited-service restaurant in a district was not a significant factor affecting individuals’ BMI. However, individual factors affecting BMI were different each other. Age and exercise habit is significant factor affecting individuals’ BMI in both study. However, interpretation is opposite way.

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