Litterature review by topic

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February 20, 2019

Contents

1 Neighborhood environments and obesity

1.1 References about physical environment

- **Barrientos (2017) – 45-84 years old – Prospective cohort**

  Setting 6 US urban areas

  Outcome BMI

  Exposure Perceptive: Healthy food availability, walkablle environment. – survey was conducted to different sample and aggregated for 1 mile and used as proxy for this study samples. Objective: Density of supaermarkets and fruit-and-vegetable markets, recreational resouces within 1 mile form each participant.

  Confounders Time-invariant: age, sex, race, education, duration of residence. Time-varying: marital status, income, cancer diagnosis – missing information was inputed from the closest year's examination.

  Statistical analysis Within-person change for environment vs within-persion change in BMI was estimated by fixed-effects models. Model 1 included each measure separately – food and physical activity (perceptive and objective), Model 2 included percetive and objective simultaneously by food and physical activity, Model 3 included all at once, Model 4 included z-score aggregated by food and physical activity simultaneously. In regression, neighborhood measures were transformed into sd. Sensitivity analysis was made for non-movers during the study period.

  Significance First longitudinal study accounting for changes in envrionments in both perceptive and objective measures again changes in BMI.

  Conclusion Favorable changes in both food and physical activity environment was associated with BMI reductions in obese and overweight persons.

  Takeaways

  - ♣ In recent years, neighborhood study moved from a general framework to identifying the specific mechanism – which neighborhood influence health.
  - ♣ Yet longitudinal evidences are still scarce.
  - ♣ The few studies investigated whether changes in food availability are related to changes in diet and BMI. Few studies for physical activity environment – only 1 study found that improve of recreational facilities access was associated with decrease in BMI.

- **Mason (2018) – 40-69 years old – Cross sectional study**

Setting 22 UK Biobank assessment centers

Outcome Waist circumference, BMI and body fat percentage (BIA) – centred around the mean

Exposure Physical activity facilities density within 1000m. Distance to the nearest fastfood outlets categorized as 500, 500-999, 1000-1999, 2000m.

Confounders Age, sex, ethnicity, education, income, employment, deprivation, urbanicity, residential density.

Statistical analysis Multilevel multiple linear regression with random intercepts and coefficients, accounting for the nesting of individuals within assessment centers. – final model controled for all covariates and non-exposure environment.

Significance Large national dataset which made it possible for sensitivity analysis to strengthen the robustness. Most previous studies focused on particular areas. Comprehensive confounding information from reliable dataset. Focused on commercial physical activity facilities as they are modifiable via regulatory.

Conclusion Physical activity facilities density was associated with lower adiposity. Fast food outlets proximity was also associated with lower adiposity. The association remained the same after stratified by sex, and income groups.

Takeaways

- ♣ Many research on access to fast-food outlets and obesity in the US, yet relatively little research on formal facilities for recreational physical activity.
- ♣ Many research on walkability which focus more on urban designs than receattional facilities.
- ♣ As food and physical activity environments are associated with one another, they are likely to confound the association with adiposity each other – they should be included as one of the confounders.

- **Hirsch (2014) – 45-84 years old – Prospective cohort**

Setting 6 US urban cities

Outcome Self report walking time for recreation and transportation.

Exposure Population density, retail area, residential area, social destinations, walking destinations within 1 mile from each resident, distance to bus stops, and street network ratio.

Confounders Time-invariate: age, sex, race, and education. Time-varying: income, employment, marital status, car ownership, self-rated health, and arthritis.

Statistical analysis Linear mixed models to estimate the associations of changes in the built environment and changes in walking (transportatin and recreation). Built environment measures were separetely included in the models to avoid multicolinearlity.

Significance First study examined the time-varying GIS-based built environment measures and changes in walking.

Conclusion Higher residential use and distance to busses were associated with a slightly increase in walking. Incrases in te number of social destinations, walking destinations, and street connectivity were associated with greater increases in wallking for transportation. Higher baseline levels of retail and walking destinations were associated with grater increases in leasure walking, but no changes in built environment measures were associated with leisure walking.

Takeaways

- ♣ Samples completed at least 2 examinations including baseline, complete information on walking outcomes or built environment at examinations were included.
- ♣ Several movers vs non-movers studies found that residential relocation to more walkable environment resulted in increases in physical activity – yet, these might contain unobservable preferences related to both choice of residential location and behavior.
- ♣ Future studies should aim to identify what types of changes are necessary to increase physical activity levels – potential thresholds

- **Sallis(1998) – 7 studies – Review**

Setting NA

Outcome NA

Exposure NA

Confounders NA

Statistical analysis NA

Significance First study reviewed environmental and policy intervention to promote physical activity. Proposed model on how environmental and policy interventions are implemented.

Conclusion Implementing environment and political level interventions is difficult due to lack of conceptual models and difficulties of evaluation. Further research is needed, and multiple sectors should collaborate more.

Takeaways

- ♣ As of late 1900s, environmental and policy interventions were infrequently applied for the control of chronic diseases.
- ♣ Ecological and social-ecological models of human behavior have evolved in the fields of sociology, psychology, education, and public health.
- ♣ The concept of ecological model which describes the levels of influence on behaviors are developed by McLeroy.

- **Ng(2014) – 183 countries – Systematic analysis**

  Setting Worldwide

  Outcome Prevalence of obesity (Overweight:25-30, Obesity:¿=30)

  Exposure NA

  Confounders NA

  Statistical analysis Mixed effects linear regression to correct for bias in self-reports. Spatiotemploral Gaussian process regression model to estimate prevalence with 95 percent uncertainty intervals.

  Significance Up-to-date information for global obesity trends. It will be important for decision making on what action is needed and where progress is.

  Conclusion Especially in low-income and middle-income countries, urgent intervention is needed to modify obesogenic environment.

  Takeaways

  - ♣ Although health risk of obesity is established and obesity prevalence has been increasing worldwide, no national sucess stories have been reported in the past 33 years.
  - ♣ The rising prevalence of overweight and obesity in several countries has been described as a global pandemic.
  - ♣ In 2010, overweight and obesity were estimated to cause 3-4 million deaths, 4 perent years of life lost, and 4 percent of disability-adjusted life-years worldwide.
  - ♣ Prevalence of obesity and overweight has incraesed substantially in the past 30 years. The pattern of increase differ by regions, and it has been attenuated in developed countries in the past 8 years.
  - ♣ The increase of obesity prevalence can be explained by changes in energy intake such as high fat and calorie diet, decrease in energy expenditure such as decrease in physical activity, and chages in the gut microbiome.

- ♣ Most deaths atributable to overweight and obesity are cardiovascular deaths. Only 31 percent of he coronary heart disease risk and 8 percent of the stroke mortality risk associated with obesity is mediated through raised blood pressure and cholesterol.

- **Kawakami(2011) – 35-80 years – Prospective cohort**

  Setting Sweden

  Outcome Age-standardised incidence proportions (proportions of subjects who became cases among those who entered the study time interval) for men and women separetely.

  Exposure Fastfood restaurants, bars/pubs, physical activity facilities, healthcare facilities by neighborhood count, individual buffer count, and distance.

  Confounders Age, income, neighborhood deprivation index.

  Statistical analysis Multilevel logistic regression for incidence propotions of CHD as an outcome. Model 1. CHD vs ne, Model 2. CHD vs ne + nedep, Model 3. CHD vs ne + nedep + age + income.

  Significance First study conducted multilevel investigation to examine the longitudinal individual-level association between CHD and neighborhood availability of potentially health-promoting and health-damaging goods.

  Conclusion

  Takeaways

  - ♣ Several studies found that neighborhood SES affecs cardiovascular health over individual-level SES.
  - ♣ Living in deprived neighborhood tend to have limited access to healthy food resources, and it would lead to increase the risk of CHD. However, no clear pattern was found between the availability of different types of resources and level of neighborood deprivation.
  - ♣ There was a week association between neighborhood availability between CHD. There was an unexpected direction association between physical activity and healthcare facilities and CHD.
  - ♣ The association between neighborhood deprivation and CHD are well established, but the causal pathway is largely unknown. This study aimed to identify whether neighborhood health-damageing/promoting facililites lie in the causal pathway. The findings did not give expected results. Neighborhood deprivation is equal to neighborhood SES? Is the assocaition between neighborhood deprivation/ses and obesity also established?

- **Hamano(2017) – 0-14 years – Prospective cohort**

  Setting Sweden

  Outcome Obesity diagnosed by ICD-10.

  Exposure Fastfood restaurants, within SAMS and 1000m buffer.

  Confounders Age, maternal marital status,family income, parent education level, parent birth place, maternal urban/rural status, moving status, maternal age at hildbirth, parent hospitalisation, family history of obesity.

  Statistical analysis Multilevel logistic regression for the cumulative rate of obesity.

  Significance Multilevel analysis by controlling both individual and neighborhood SES with an large follow-up sample.

  Conclusion Fast food outlets were associated with childhood obesity after adjusting for individal and neighborhood SES.

  Takeaways

  - ♣ Further studies should be done by taking other physical environmental features into accont.

- **Sundquist(2014) – Unknown – Prospective cohort**

  Setting Sweden - Stockholm

  Outcome Clinically diagnosed type 2 diabetes.

  Exposure Neighborhood walkability index.

  Confounders Age, gender, income, education, NDI.

  Statistical analysis Multilevel logistic regression with individuals nested within their neighborhood.

  Significance This was one of the few studies examine the objectively measured walkability and health oucome, i.e., incidence of diabetes in a large cohort.

  Conclusion There was a siginficant association between walkable enviornment and incidence of type 2 diabetes after adjusting for neighborhood deprivation. However the association did not remain after further adjusting for individual socio-demographic characteristics. Future research should consider other potential risk factors for diabetes, such as traffic noise or air pollution which may come along with walkable environment.

  Takeaways

- ♣ There is a need to examine whether individual and neighborhood socioeconomic characteristics may modify the association between the built environment and health related behaviors (Lovasi 2009). Because socioeconomically disadvantaged individuals may be less likely to benefit out from neighborhood envrionment.
- ♣ No significant interaction was found between walkability and individual SES, or walkability and neighborhood deprivation.
- ♣ Several studies found association between walkability and physical activity after adjusting for individal and neighborhood sociodemographic factors (Sundquist 2011).

- **Sundquist(2011) – 20-65 years – Cross-sectional study**

  Setting Sweden - Stockholm

  Outcome Physical activity: MVPA min/day, Time in 10-minutes bouts of MVPA min/day, Walking for AT min/day, Walking for leisure min/day.

  Exposure Neighborhood walkability index.

  Confounders Age, gender, marital status, family income, neighborhood income.

  Statistical analysis Multilevel linear regression with individuals at the first level and neighborhoods at the second level. Model 1: PA vs walkbility. Model 2: PA vs walkability + individal characteristics + neiborhood income.

  Significance First study in Sweden to examine objectively measured PA and obejectively measure walkability.

  Conclusion There is a significant association between walkability and physical activity in Swedish adults.

  Takeaways

  - ♣ Interaction between walkability and neighborhood level SES wre not found.
  - ♣ Australia had a significant interaction between SES and walkability (Leslie, 2007), while no interaction was found in Sweden and Belgium. It might be because of low SES inequalities in these countries.

- **Gortmaker(2011) – NA – Review**

  Setting Australia, US

  Outcome Effect of policy level intervention

  Exposure NA

  Confounders NA

Statistical analysis NA

Significance Identify several cost-effective policies that gonvernment priotize for obesity prevention.

Conclusion A rapid increse of efforts for cost-effectiveness analysies of programmes and polices for obesity prevention is needed.

Takeaways

- ♣ Important causes for obesity is identified, which is a result of changes in the global food system - the movement from individual to mas preparation, producing more highly processed food.
- ♣ Other factors: national wealth, government policy, cultural norms, built environment, genetic and epigenetic mechanisms, biological bases for food preferences, biological mechanisms that regulate motivation for physical activity amplify or attenumate the effect of thoes causes (nutrition change), and all infulence growth of the epidemic.
- ♣ Most countries do not have enough monitoring data for population physical activity and diet pattern, and obesity prevalence, and it stands as barrier to set an appropriate goal and also assess progress.
- ♣ Obesity could yeild in not only lowering future life expectancy but also increasing short-term and long-term healthcare spendings.
- ♣ Body weight response to a change of energy balance is slow. A small but chronic daily energy imbalance gap has caused the continuing weight gain seen in most countries.
- ♣ Population intervention for obesity should have effect on equity, acceptability to stakeholders, feasibility of implementation, affordability and sustainability to put policy decision forward.
- ♣ Goverment is the main actor for obesity prevention.Obesity mainly burdens the health system, but various sectors, i.e. finance, eudcation, agriculture, transportation and urban planning have the greatest impact on creating environment conducive to prevention.

1.2 References about social environment

- Some name (1902) – 300 adults – Furniture store
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