01 - Paper analysis

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Introduction

We analysed Bohannon et al.'s paper [1] using the PPDAC investigative cycle. For each step and sub-step we listed what the authors explicitly or implicitly did, identified potential sources of error, and critiqued their choices.

Methods - PPDAC

Problem

It is obvious that the authors' **unit** of interest is a person, meanwhile their **target population** are people on a low-carb diet.

Their primary interest – **response variate** is human weight. The authors researched how daily consumption of chocolate with 81% cocoa content affects low-carb diet which is our **explanatory variate**. They also analysed how low-carb diet affects weight without the chocolate consumption.

The **functional of interest** is weight variability based on chocolate consumption.

The **aspect** of the problem is predictive, but the authors treat it as it were causative. The authors claim that daily consumption of chocolate helps with weight loss and has many other benefits, even though their analysis cannot support such claims – the main reason is small number of participants and not addressing the explanatory variates.

Plan

Study unit of interest is still a person but **study population** is what we can assume from the paper 3 groups of 5 people.

Weight is well defined so it is still our **response variate**. The authors also measured other **population attributes** that are affected by weight loss, such as: BMI, waist-to-hip ratio, ketone and lipid levels, liver and albumin values, amount of sleep.

As we mentioned in the problem part, researchers were interested in weight change based on daily chocolate consumption and its value is fixed determined from individual's assigned group. But there are many **explanatory variates** such as physical activity, family history and genes, living location, beverage choice, that the authors do not explicitly state and do not observe them.

Measuring process was a bit biased. The authors explain that the study subjects measured weight on their own, which could affect the results, since we can assume they did not use professional equipment. They also did testing of the urine with multiparameter strips on a daily basis by using test strips which could be biased. Their blood levels were measured at the start and end of the study, which we assume were without error. They also documented their mental state and sleep behaviour which is biased.

Sampling protocol was the biggest flaw in the study. The authors randomly assigned, we assume 15 subjects to one of three groups. The testing period lasted several weeks. Authors tried to represent the disproportionate number of female dieters in the general public so two-thirds of the participants were female. This sample is not even close to a representative sample, since the number of subjects is so small. The authors do not discuss any potential problems.

The authors should also state something about **data collection protocol**.

Data

The authors do not discuss any parts of the Data stage and it is safe to assume that they did not consider any type of data examination before analysis.

Analysis

The authors compared weight between groups but did not provide any uncertainty or exact dates. We only get exact dates for ketone levels, meanwhile we get uncertainty only for lipid levels, liver and albumin values.

Conclusion

Authors state that "chocolate with a high cocoa content can significantly increase the success of weight-loss diets" even though they cannot make such a claim with this study. They also mention other positive attributes which were in my opinion hand picked so they "visually support" their claim better.

Discussion

We analysed Bohannon et al.'s paper [1]. With the help of PPDAC investigative cycle we conclude that this study was flawed and the authors cannot support the claims they made. Authors suggest they performed a causative analysis, even though their study population is a not representative sample and do not address any other explanatory variable other than amount of chocolate consumption and low-carb diet.

References

[1] Johannes Bohannon, Diana Koch, Peter Homm, and Alexander Driehaus. Chocolate with high cocoa content as a weight-loss accelerator. *International Archives of Medicine*, 8, 12 2015.