# An essay on the research article regarding “Diet and exercise following direct-to-consumer personal genomic testing’’

The basic motivation is the fact that results exist of personal genomic test in our health behavior such as diet and exercise. Findings show a decrease up to 50% regarding the risk of coronary artery disease pointing those with high genetic risk. (Research Article: Diet and exercise changes following direct-to-consumer personal genomic testing, Nielsen et al.BMC Medical Genomics, 2017 )The problem which this research is trying to solve is ‘’to evaluate diet and exercise changes following PGT and to determine if changes were associated with genetic test results regarding PGT.’’1Besides that it can be mentioned that regarding hypertension **’’Dietary** **approaches** **to** **stop** **Hypertension or the DASH diet** is a diet promoted by the National Heart, Lung and Blood Institute(part of the NIH)to stop hypertension.’’2Also as a result could be mentioned the fact that ‘’Previous studies examining this question have reported that PGT is not associated with diet and exercise changes”3

1.Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing

2.Dietary Approaches to stop Hypertension WikiDoc

3.Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing

INTRODUCTION:

The importance of PGT is that it can provoke beneficial development in lifestyle which could decrease the risk of coronary artery disease at 50% relating those who have high genetic risk.( 1.Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing).Also one important matter is if happens or not happens for PGT to provoke diet and exercise changes which could help for chronic diseases which are related with lifestyle to be avoided like heart disease and type 2 diabetes. The summary of previous work regards four studies ended up to the fact that a healthy lifestyle could decrease the risk of coronary artery disease at 50% regarding those with high genetic risk. As far as knowledge gap filling is mentioned, the first regulatory approval of DTC-PGT in the United States has relighting the interest in the utility of genomic information without health-care professional participation.( Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing) Regarding previous work related it can be quoted the following:’’ Previous studies examining this question have reported that PGT is not associated with diet or exercise changes [8,9]or that PGT experience generally, including the personal context in which testing is sought (but not the individual genetic risk information received),is associated with non-specific, positive health behavior changes[10].These prior investigations have been limited by selected convenience samples[8]’’4

METHODS:

Regarding the source of data the following can be mentioned:’’ The impact of Personal Genomics (PGen) Study is a longitudinal survey assessment of actual PGT consumers from two companies 23andMe, Inc.(23andMe) and Pathway Genomics Corp.(Pathway).’’5Regarding the date of collection the according can be mentioned: ’’In February 2015, the FDA approved the first 23andMe health report and as of October 2015 the company is returning carrier status reports (a subset of previous offerings)to consumers[6]’’6Methods of data collection concern the following: Outcomes come from Personal Genomic Test (PGT) and Self Reported Health (SRH) and a use of linear regression exists.( Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing).A brief data summary means that whether PGT provokes positive health lifestyle changes as well as it differs among users regarding their health status.( 1.Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017,Diet and exercise changes following direct-to-consumer personal genomic testing)

RESULTS:

“From the 1042 participants who submitted both a baseline and 6-month survey, complete data required for our analyses were available from 1002 participants. Demographic characteristics of the analytic sample are reported in Table [1](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#Tab1). Baseline diet and exercise variables did not differ between baseline responders eligible for follow-up (n = 1464) and the final analytic sample (n = 1002). Among the 1002 participants with complete data, modest, but statistically significant increases in vegetable intake and strength exercise frequency were observed (Table [2](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#Tab2)). Vegetable intake increased by an average of 0.11 servings per day and frequency of at least 10 min of strength exercise increased by an average of 0.14 days per week. When stratified by SRH, significant increases in all diet and exercise behaviors were observed among the lower SRH group, while a significant decrease in light exercise frequency was observed among the higher SRH group (average decrease in frequency of 0.25 days per week). Adjusted linear regression models with the Tukey-Kramer pairwise comparison demonstrated that only change in light exercise differed significantly between the two SRH subgroups (p = 0.0452). The direction of the observed change in light exercise was opposite between the two groups (i.e. increase in frequency among the lower SRH group, decrease in frequency among the higher SRH group).”7

Table 1

Baseline demographics stratified by self-reported health

| **Variable** | **Baseline responders eligible for follow-up (*n* = 1464)** | **Baseline responders with complete data**  **(*n* = 1002)** | **Poor/Fair/Good**  **SRH**  **(*n* = 449)** | **Very Good/**  **Excellent SRH**  **(n = 551)** |
| --- | --- | --- | --- | --- |
| n (%) | | | | |
| Male | 567 (38.7) | 401 (40.0) | 156 (34.7) | 245 (44.5) |
| Race | | | | |
| White | 1234 (84.3) | 860 (85.8) | 383 (85.3) | 475 (86.2) |
| Black | 37 (2.5) | 23 (2.3) | 11 (2.5) | 12 (2.2) |
| Asian | 50 (3.4) | 32 (3.2) | 8 (1.8) | 24 (4.4) |
| Other/Multi-Ethnic | 143 (9.8) | 87 (8.7) | 47 (10.5) | 40 (7.3) |
| Hispanic | 81 (5.5) | 50 (5.0) | 25 (5.6) | 25 (4.5) |
| Education | | | | |
| Less than College | 319 (21.8) | 204 (20.4) | 117 (26.1) | 87 (15.8) |
| College Degree | 448 (30.6) | 305 (30.4) | 118 (26.3) | 186 (33.8) |
| Some Graduate Degree | 513 (35.0) | 359 (35.8) | 162 (36.1) | 196 (35.6) |
| Doctoral Degree | 184 (12.6) | 134 (13.4) | 52 (11.6) | 82 (14.9) |
| Annual Income | | | | |
| < $40,000 | 242 (16.5) | 171 (17.1) | 102 (22.7) | 69 (12.5) |
| $40,000–$69,999 | 272 (18.6) | 183 (18.3) | 84 (18.7) | 98 (178) |
| $70,000–$99,999 | 288 (19.7) | 205 (20.5) | 96 (21.4) | 108 (19.6) |
| $100,000–$199,999 | 457 (31.2) | 303 (30.2) | 121 (27.0) | 182 (33.0) |
| ≥ $200,000 | 184 (12.6) | 128 (12.8) | 38 (8.5) | 90 (16.3) |
| Missing | 21 (1.4) | 12 (1.2) | 8 (1.8) | 4 (0.7) |
| PGT company | | | | |
| 23andMe | 947 (64.7) | 620 (61.9) | 232 (51.7) | 386 (70.0) |
| Pathway Genomics | 517 (35.3) | 382 (38.1) | 217 (48.3) | 165 (30.0) |
| Mean ± standard deviation (Range) | | | | |
| Age | 47.5 ± 15.5 (19 – 94) | 46.9 ± 15.6 (19 – 94) | 47.6 ± 15.1 (19 – 91) | 46.2 ± 15.9 (19 – 94) |
| BMI | 26.9 ± 6.0 | 26.9 ± 6.0 | 28.8 ± 7.1 | 25.3 ± 4.4 |
|  | (15.4 – 62.0) | (16.1 – 62.0) | (16.1 – 62.0) | (16.6 – 47.3) |
| Fruit Servings per Day (0–5+) | 2.0 ± 1.1 | 2.0 ± 1.1 | 1.9 ± 1.1 | 2.2 ± 1.1 |
| Vegetable Servings per Day (0–5+) | 2.5 ± 1.2 | 2.5 ± 1.2 | 2.3 ± 1.1 | 2.7 ± 1.2 |
| Light Exercise per Week (0–7) | 3.5 ± 2.3 | 3.5 ± 2.3 | 3.3 ± 2.2 | 3.7 ± 2.2 |
| Vigorous Exercise per Week (0–7) | 2.3 ± 2.1 | 2.4 ± 2.1 | 1.8 ± 2.0 | 2.8 ± 2.1 |
| Strength Exercise per Week (0–7) | 1.4 ± 1.8 | 1.4 ± 1.8 | 1.1 ± 1.8 | 1.7 ± 1.8 |

DISCUSSION:

“Limitations of this study include its reliance on self-reported data and observational design. However, the consistency we observed across survey items measuring similar effects (i.e. change in specific diet and exercise variables and general self-report of diet and exercise changes) is reassuring. Moreover, our study improves upon limitations of previous observational work, particularly in its measurement of pre- and post-disclosure changes to specific diet and exercise variables using validated tools, consideration of baseline health status, measurement of participants’ perceptions of their own disease risks, and our sample of customers who sought commercial PGT online [[18](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR18)]. While the PGen Study sample is somewhat homogeneous (e.g., largely White), there is evidence to suggest that PGen Study enrollees are broadly representative of the typical DTC-PGT consumer [[12](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR12)]. Our findings are not intended to be generalizable to the general U.S. population, but rather to the individuals who pursue commercial DTC-PGT. The changes we observed to diet and exercise were self-reported and just fractions of a dietary serving and exercise frequency, so the significance of these observations as they relate to health outcomes is uncertain. We also did not distinguish between variable factors such as exercise duration or type of fruit or vegetable. Moreover, it is unclear to what extent reporting may have been influenced by social desirability or persisted longer than 6 months. However, modest improvements in diet and exercise have been shown to be associated with population health [[31](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR31), [32](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR32), [33](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR33)]. Finally, because this was an observational study, the design does not enable us to have accounted for all factors that could have influenced our outcome variables of interest. Moreover, we cannot rule out the possibility that our findings were due to chance, particularly given the number of hypothesis tests performed. We also note that the DTC-PGT climate in the United States has changed since the PGen Study was conducted [[1](https://bmcmedgenomics.biomedcentral.com/articles/10.1186/s12920-017-0258-1#CR1)], and that 23andMe no longer offers consumers the disease risk estimates reported here, while Pathway Genomics has left the DTC market altogether. Thus, our findings do not accurately reflect a current product on the market, but have the advantage of capturing a consumer experience about which the FDA has requested additional research, and which may be reintroduced in the future, pending FDA approval.”8

Implications of result:

“Our sample of PGT consumers made diet and exercise changes following PGT. These changes were independent of both cardiometabolic genetic risk and total genetic risk, and were also independent of changes in disease risk perception. As advanced genomic technologies (e.g., whole genome/exome sequencing) become more accessible to consumers, it will be important to assess whether or not these technologies have a similar impact on diet and exercise behaviors.”9

4.5.6.7.8.9. Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017, Diet and exercise changes following direct-to-consumer personal genomic testing

REFERENCES: Nielsen et al.BMC Medical Genomics, BMC Medical Genomics,2017, Diet and exercise changes following direct-to-consumer personal genomic testing

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