Statistical Concepts
MTH 107
Prof. Derek Ogle

Carrie Welter
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Introductory Statistics Project

Reusable vs. Disposable:
A Statistical Analysis of Menstruation Product Use at Northland College

Introduction

The current cultural conception of menstruation in Western nations is often framed in a "negative light" (Kirk & Sommer, 2005). Cultural taboos condition girls to view their monthly cycle as a private matter and often lack knowledge of what is happening to their bodies during this time. This research project can be valuable in developing more effective, girl-empowering education on the topics of women's health in order to better prepare young females for the experiences of sexual maturation.

After attending Northland for three and a half years, I look back on the ideas that were introduced to me that have completely revolutionized the way I perceive the world today. Fall of freshman year I attended a discussion of alternative menstruation products at Gaia's Cradle with a few friends. This informative session focused on the unhealthy qualities of mainstream disposable menstruation products and how corporations capitalize and control how we feel about our own bodily processes. The attendees were introduced to reusable menstruation alternatives such as the Diva Cup, the Keeper, sea sponges and washable cloth pads. This discussion not only empowered me and others to feel more comfortable talking about menstruation and sexual health, but also illustrated how culturally conditioned our conceptions of our own bodies are.

Other opportunities at Northland have led me to become more awake to alternatives to the mainstream, and how to live a more sustainable lifestyle. As a member of Environmental Council, I have become involved in engaging students in sustainability initiatives on campus, removing barriers so that individuals and the institution as a whole can be more sustainable. Some Northland students strive to live lifestyles that impact the earth as lightly as possible. As a sociologist and environmentalist, I'm inquisitive about

the process of creating social change, aware of how socialization works, observant of how communities impact their environment and their environment shapes them.

These experiences have caused me to wonder how many women at Northland are aware of the existence of alternative menstruation products and how many prefer reusable to disposable products. We live in a resource-guzzling developed nation where consumer culture dominates, packaging pervades, landfills overflow- what will it take to instigate a mass shift in outlook towards making things from scratch and disposal of our disposable mentalities? At the heart of this research, I wanted to explore the comfort level of women with their periods, how many women at Northland are aware that there are reusable alternatives and what impact their year in school has on that the product they prefer. The main objective of the study was to explore the relationship between year in school and what the preferred menstruation product of choice is. Upper classmen at Northland may have more knowledge of alternative menstruation products because our college does offer learning opportunities, compared with other schools which may not offer this information as accessibly.

The results of this project are important in understanding cultural perceptions of menstruation. These results could be utilized in determining the availability of information about these products and how to educate women of the alternatives at Northland, as well as outside of the college. The local women's health clinic or Nurse Judi may be able to use the data to in order to develop educational programs and advocate for sustainable options for women during their menstruation.

My research hypothesis for this categorical study is the preferred choice of menstrual product will differ between under-class women and upper-class female students at Northland College.

Methods

In search of an explanation for the relationship between the year in school and the preferred product of choice, I created a survey in order to examine a sample of the female population at Northland. The survey consists of two questions in which each participant

was asked to give the year in school and the preferred menstruation product of choice (see Sample Survey).

In order to collect the most randomized sample as possible, I utilized a computer generated Simple Random Sample (SRS). I first found the student directory and compiled a list of mailbox numbers for all the female students at Northland. After assigning a number starting at 1 and going to 340, I employed the R program to create a SRS of 100 individuals from this list. I wrote their mailbox number on the back of each survey and gave them to the post office ladies to distribute. This data gathering method was a voluntary response survey that was randomized because of the manner in which the individuals were selected. Out of the 100 surveys I distributed, I received 25 completed surveys back.

To analyze the data, I performed a Chi-square test statistic.

Results

Hypothesis Test

As the Chi-square test indicates, the proportion distribution of preferred method of menstruation is the same for Freshman/Sophomores as Junior/Seniors at Northland College.

1.) The appropriate test statistic to use is the Chi-square because the study is comparing two populations (FR/SO and JNR/SNR) and seven levels of categorical response variables (preferred menstruation product).

2.) Ho: The proportion distribution of preferred method of menstruation is the same for Freshman/Sophomores as Junior/Seniors.

Ha: The proportion distribution of preferred menstruation product differs for FR/SO compared with JNR/SNR.

3.) $\alpha = 0.05$

4.) Observational design with randomly sampled individuals selected through computer generated SRS.

5.) The expected number of observations in each cell is less than 5, therefore assumptions are not met. However, for the sake of this project being on a small

scale with a limited amount of time to gather data, I will continue with the hypothesis test.

Table 1.1 Expected Table

Summary of the expected distribution of the preferred product of Freshman/Sophomores and Juniors/Senior female Northland students.

year	Tampons	Disposable Pads	Menstrual Cup	Washable Cloth pads	Sea Sponge	Tampons/ Disposable Pads
FR/SO	1.304348	1.304348	1.565217	0.2608696	0.2608696	1.304348
JR/SR	3.695652	3.695652	4.434783	0.7391304	0.7391304	3.695652

(two surveys were eliminated because they circled g. I don't feel comfortable answering this question).

6.) Table 2.1 Observed Table

Summary of the observed preferred menstruation products of female Northland college students.

year	Tampons	Disposable Pads	Menstrual Cup	Washable Cloth Pads	Sea Sponge	Tampons/Disposable Pads	Total
FR/SO	2	1	1	0	0	2	6
JR/SR	3	4	5	1	1	3	17

7.) The x^2= 2.082 with df of 5 (Table 3.1).

Table 3.1 Summary of Chi-square results

Pearson's Chi-squared test

data: freq.tble
X-squared = 2.082, df = 5, p-value = 0.8377

8.) The p-value for the test statistic is 0.8377(Table 3.1).
9.) The p-value is greater than α, thus do not reject Ho.
10.) It appears that the percent distribution of preferred method of menstruation is the same for Freshman/Sophomores as Junior/Seniors.

Appendix

Sample Survey

1.) What year in school are you?

Freshman/Sophomore

Junior/Senior +

2.) What is your preferable menstruation product of choice? (Circle one or more if applicable)

a. Tampons
b. Disposable Pads
c. Menstrual Cup (e.i. The Diva Cup, Keeper, Moon Cup etc.)
d. Washable cloth pads
e. Sea Sponge
f. Other_____
g. I don't feel comfortable answering this question.

R Index

```
data <- read.table("statsproject1.txt",head=TRUE)
p.chi$expected
p.chi$observed
data.chi
    Pearson's Chi-squared test

    data:  freq.tble
    X-squared = 2.082, df = 5, p-value = 0.837
```

Discussion

The outcome of this research was intriguing. The hypothesis that was proven correct was the percent distribution of preferred method of menstruation is the same for Freshman/Sophomores as Junior/Senior females at Northland College. This surprised me because I expected upper class women to be more informed about these products as they spent more time at Northland. However, because of the limited resources and a small sample size, this study should be considered completely accurate of the whole population, but rather only as preliminary research. At this initial phase of examining the hypothesis,

there is no evidence of a difference between lower and upper-class women in their preferred menstruation product.

Problems in the research include how the data was collected and bias in population. In view of the fact that the subject matter is considered a personal topic I didn't know if women would feel comfortable with random interviews. There were two surveys indicating that the individuals were uncomfortable answering the question. The survey method worked somewhat well, although the women who responded may be those who are most aware or interested in the topic, which could have created biased data. The sample size of 25 could have been more substantial if I had more time and resources to gather a greater sample size. Because Northland is such a small liberally skewed population, women here are probably influenced and more likely to be exposed to alternative menstruation options.

The fact that this research was performed at all is crucial to reconditioning women in our culture to question the products they are sold by major corporations, overcome the taboo of discussing sexual health and explore the options that work best for them.

Works cited

1.) Kirk and Sommer. "Menstruation and body awareness: linking girls' health with girls' education." Page 1. 2005. http://www.schools.watsan.net/content/download/323/2726/file/Kirk-2006-Menstruation-KIT%20paper.pdf