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Primary and Secondary Interventions to Address Common Female Reproductive Health Issues on College Campuses

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**Primary and Secondary Interventions to Address Common Female Reproductive Health
Issues on College Campuses**

By

Alison Yelsma

**A Capstone submitted to
Dr. Amos O. Aduroja
In Partial Fulfillment of the requirements of PH 4920**

**College of Health & Human Services
School of Interdisciplinary Health Programs
Public Health Program**

**Western Michigan University
Kalamazoo, Michigan
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Abstract

My public health capstone/honors thesis was about primary and secondary interventions for college students on the topic of, and surrounding, common female reproductive health issues. I requested current female college students to complete a questionnaire with questions that addressed their knowledge, attitudes and practices in this area. Responses from process and content questions were used to develop suggested peer support and educational sessions for college campuses surrounding endometriosis and polycystic ovarian syndrome (PCOS).

Introduction

Overview:

Topic Background

The topic of interest was to develop primary and secondary interventions for college students with female reproductive health issues. Currently, there are a lot of efforts towards preventing unwanted pregnancies and sexually transmitted infections (STIs) on college campuses. There is a lack of initiatives, specifically addressing education and support, to help college students with endometriosis, polycystic ovarian syndrome (PCOS), and other similar female reproductive health conditions. Endometriosis is a common reproductive health issue where tissue that lines the uterus also grows outside of the uterus, in the pelvic region and sometimes can spread further. (“Endometriosis”, 2020). The prevalence rate of endometriosis among reproductive-aged women in the United States is 11% (“Endometriosis”, 2019). PCOS is a complex hormone disorder that is characterized by excess androgens, irregular periods, and polycystic ovaries (“Polycystic”, 2020). Hirsutism and acne are also typical in PCOS phenotypes. About 10% of women aged 15 to 44 years old in the United States are diagnosed with PCOS. (“Polycystic,” 2019). Endometriosis and PCOS are the two most common female reproductive health conditions, while others include uterine fibroids, pelvic inflammatory disease and cancers of the female reproductive organs.

Personal Interest

The personal interest of this capstone is because I have PCOS and personally understand how difficult it is to learn about the condition and find support at college. I have many friends and peers with PCOS and/or endometriosis that also do not know what lifestyle changes (nutrition, exercise routines, stress management, sleep hygiene, etc.) that they can make to better

manage their symptoms or where to get support as well. I have heard countless stories of a person receiving a diagnosis with little explanation and just the suggestion to manage weight and stress. Since PCOS and endometriosis are so common, it is important for college campus health centers to have programs that offer education, support, and other resources to help students with these health conditions.

PICOTS Model

The PICOTS model breaks down the essential variables in this capstone for the proposed program. The population would be college students with endometriosis and/or PCOS. The primary interventions would be educational lessons to reach students that have the disease(s) in their family and want to try to prevent themselves from developing the health conditions, as PCOS has a genetic component (“Polycystic”, 2020). These educational modules could also be accessible for students that want to have a better understanding of either condition to support a friend or family member. The secondary interventions would be support groups for students that are recently diagnosed and/or living with one or both of these conditions. The interventions for these groups are suggested to have peer educators and be tailored to the local community by sharing what resources already exist. For comparison, the participants would be tested after they participate in the program to compare their education level of the female reproductive health issues, as well as their self-disclosed levels of support and their quality of life. Pre- and post-tests are the suggested method of evaluation to be done at the start and end of the academic year. The first main outcome for these interventions is for participants in this program to receive education on female reproductive health conditions - for a better understanding of their diagnosis and to increase their health literacy. The second outcome is to increase feelings of support. The time

would be one academic year, so nine months in total. The setting for the program would be the campus health center.

Literature Search:

Through extensive search, I was unable to find a college campus peer education program focused on just female reproductive issues. One reason is that most United States high school sexual health education programs are not comprehensive so many universities are offering programs to “fill the gap” by educating students on topics related to sexual and reproductive health (Wong, 2019). Countless programs exist for sexual health topics such as pregnancy prevention, HIV/AIDS prevention, sexually transmitted infection (STI) prevention, safe sex practices, healthy relationships, etc. This program could use the success of similar programs. A popular method is the use of peer educators. Peer educators are beneficial because they rely on the social cognitive theory (SCT) by addressing attitudes, knowledge of behaviors, and self-efficacy (Wong, 2019).

A peer education program that addresses the education and support needs of college students with female reproductive health issues is needed due to the high prevalence of the population that has endometriosis and PCOS. Endometriosis is a gynecologic disease that is estimated to affect 10% of females of reproductive age. (Gallagher, 2018). While PCOS affects up to 18%, nearly one in five, of reproductive-aged females (Gibson-Helm, 2017).

An issue surrounding college peer education programs on sexual and reproductive health is that the same barriers would exist that college students already face when accessing reproductive health services including “service access”, “service entry,” “quality of service” and “social ramifications” (Bersamin, 2016). A way to combat these barriers is to individually reach students through the use of free smartphone apps and text messages. (Bersamin, 2016).

The need for a program that educates and supports college students with female reproductive health issues is that adolescents and young adults with these conditions have decreased quality of life. Patients under 25 years old that have endometriosis were more likely than their peers to self-report severe pelvic pain, avoidance of exercise during flow, an earlier age of menarche (the first period), “trouble engaging in social activities”, as well as higher rates of anxiety and depression disorders that required medication or therapy (Gallagher, 2018). Similar results were found in a meta-analysis of the quality of life in adolescents and young adults with PCOS. Those with PCOS had higher body mass indexes (BMI), more anxiety and depression, and decreased self-confidence and self-esteem, as skin and hair problems play a significant role in one’s body image. A specifically concerning category that individuals with PCOS scored lower than peers on related to “loss of femininity, loss of sexuality and infertility”. (Kaczmarek, 2016). A program that addresses the gaps in education and support for university students with female reproductive issues, such as endometriosis and PCOS, would assumedly lead to better qualities of life.

A limited literature search was conducted due to the scarce information and research done on this topic.

Needs Assessment

Quantitative Method:

The needs assessment conducted in this project utilized the quantitative method. The knowledge, attitudes and practices (KAP) theory was used to develop a questionnaire to measure the extent of the problem among female students in the College of Health and Human Services at Western Michigan University. The questionnaire was approved by WMU's HSIRB board before distribution. Six questions addressed knowledge, 12 were on attitudes and 2 questions asked about practices. Three questions were transformed into one variable that was labeled overall health status. Additionally, there were 5 demographic questions and 17 questions related to the process and content of the program. The survey took place online through Survey Monkey. A descriptive analysis was conducted in SPSS software version 27 to code, manage and analyze the resulting data.

Limitations:

This survey was only distributed to female students in the College of Health and Human Services and therefore cannot be used for looking at the problem at the university level. Not all of the participants had PCOS or endometriosis. There was not a question that asked if the participant had any close female relatives that have either of the diseases. A question about overall health status was not asked either. Furthermore, a convenient sample was used.

Ethics:

Subject Recruitment

Students participated in the questionnaire by clicking the Survey Monkey link. I reached out to professors by email. All of the professors received the same email, seen in Appendix A. The goal was to have at least 30 students participate, with a maximum of 100 students. Students

with or without the health conditions (endometriosis and PCOS) could have participated so there was no inclusion/exclusion criteria. All questions were optional for the participants, so they chose to answer each one.

Informed Consent Process

Students were sent a consent form, which is Appendix B, along with the link to the Survey Monkey questionnaire. The purpose and description sections in the questionnaire were also listed before the first question. The entries from each participant were collected anonymously online to protect confidentiality. Other than taking up approximately 15 to 20 minutes of each participant's time there were no other known risks from this research. There were no direct benefits to the participants of this study identified. The assessment helped in the development of peer support sessions and educational sessions for college students on the topics of, and surrounding, female reproductive health issues. Those interventions may be important in helping college students that have endometriosis or polycystic ovarian syndrome (PCOS).

Methods of Data Collection

The questions asked is listed in Appendix C.

Instrumentation

The questionnaire was distributed using the Survey Monkey link.

Location of Data Collection

The questionnaire was accessed online through a Survey Monkey link that was emailed to a few professors at the College of Health and Human Services at Western Michigan University to forward to their students. The email template is attached as Appendix B. To guarantee confidentiality of the student participants, names and any other identifying factor was

not collected. After the data was entered, the questionnaire was deleted. All of the information gathered was only used in this study and not used by or distributed for other studies.

Duration of the Study

Student participants were able to finish the questionnaire in 5 to 20 minutes. The questionnaire link was shared during December 2nd – 18th, 2020.

Validity:

The validity of the instrument (questionnaire) was the use of instructor feedback.

Findings

SPSS version 27 was used for data management and data analysis. The findings section is a summary of the survey results. Collectively, the knowledge, practice and attitude objects of interest (independent variables) are assumed to be predictors of the participants overall health (dependent variable).

Demographics

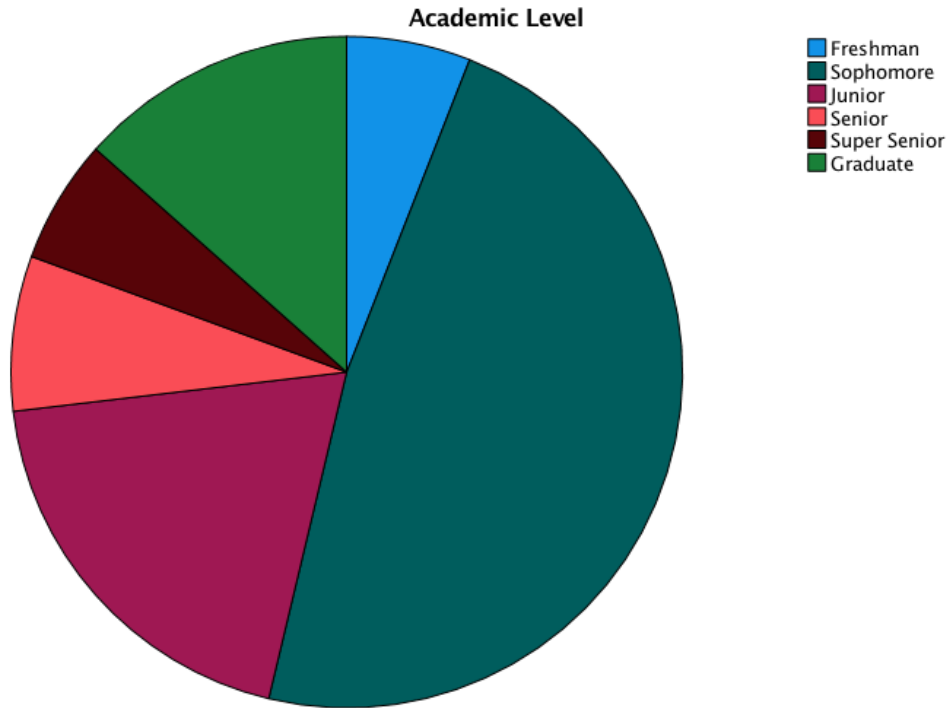
All 67 survey participants were female students at Western Michigan University. On a side note, 12 male students took the survey and their responses from the dataset were removed.

Table 1: Age of Participants

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	67	18	45	22.51	5.514
Valid N (listwise)	67				

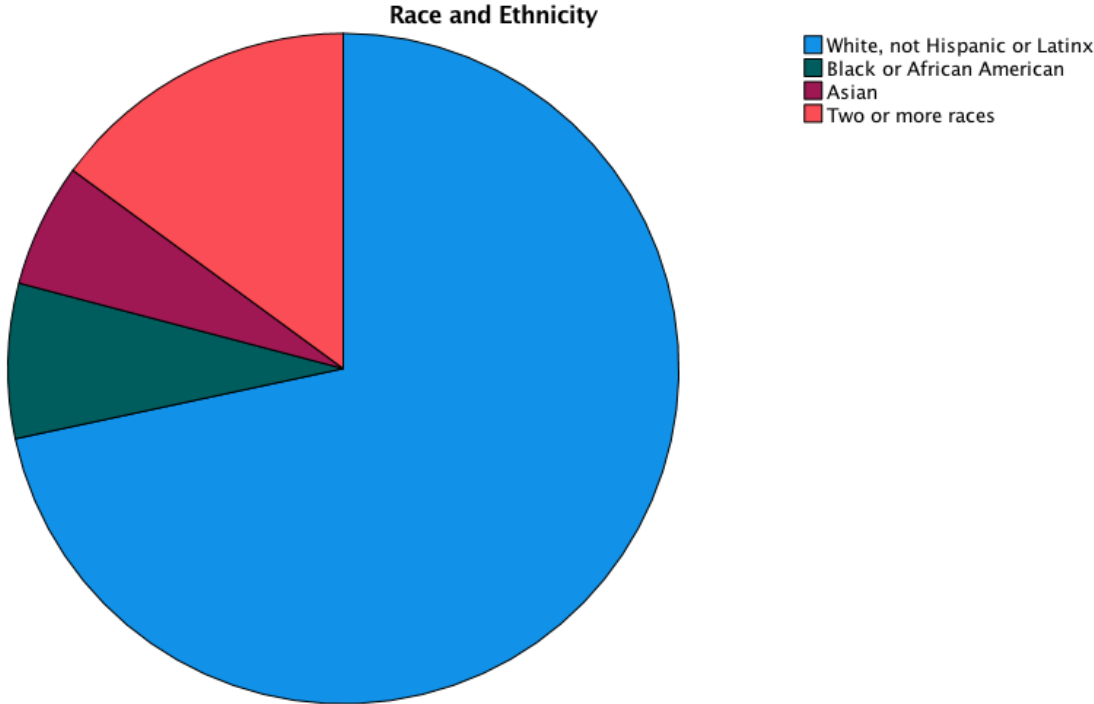
The participants ages ranged from 18 to 45 years old as of their last birthdays. The average age was 22.5 years old.

Chart 1: Academic Level of Participants



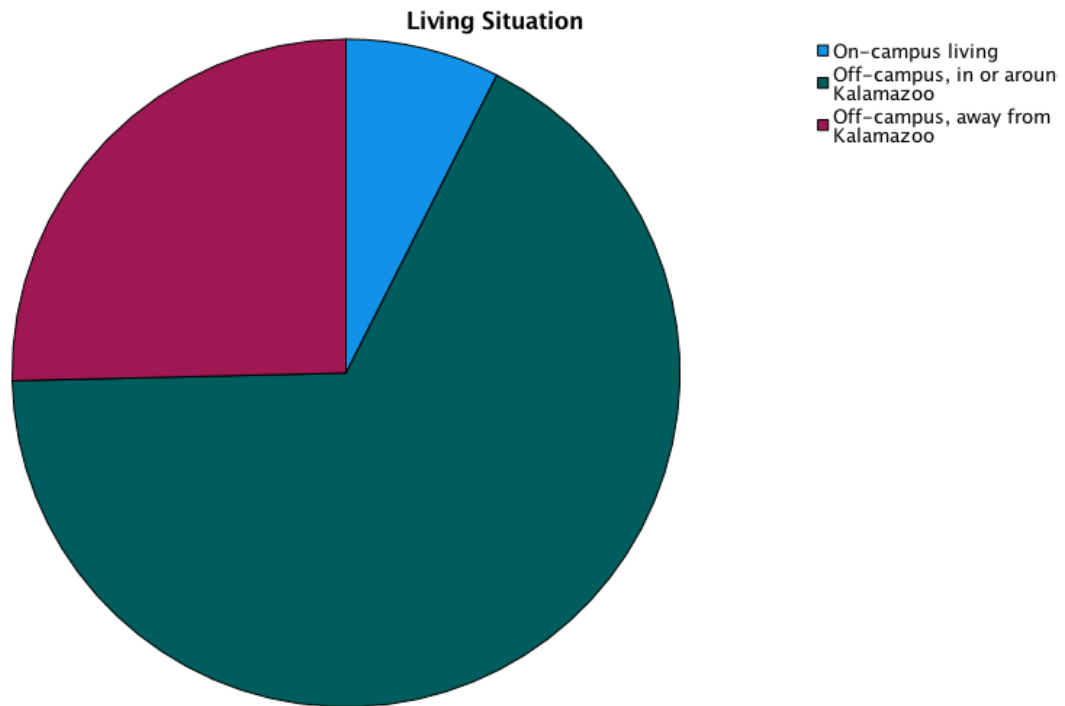
The academic levels of each participant was their current year in college. There were 4 (6%) freshmen, 32 (47.8%) sophomores, 13 (19.4%) juniors, 5 (7.5%) seniors and 4 (6%) super seniors. Super seniors were students that were in their fifth year of undergraduate schooling. Additionally, there were 9 (13.4%) graduate students.

Chart 2: Race and Ethnicity of Participants



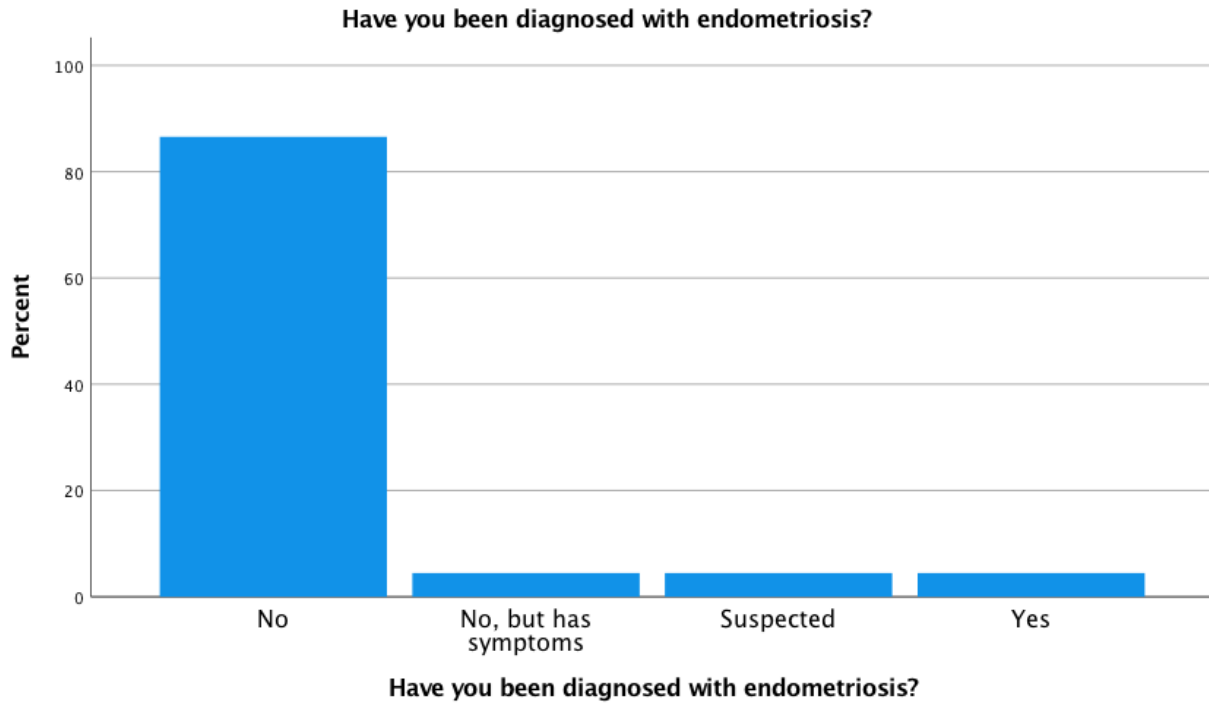
The majority, 48 (71.67%), of participants were white and not of Hispanic or Latinx ethnicity. Five participants (7.5%) identified as Black or African American, 4 (6%) Asian, and 10 (14.9%) had two or more racial backgrounds.

Chart 3: Living Situation of Participants



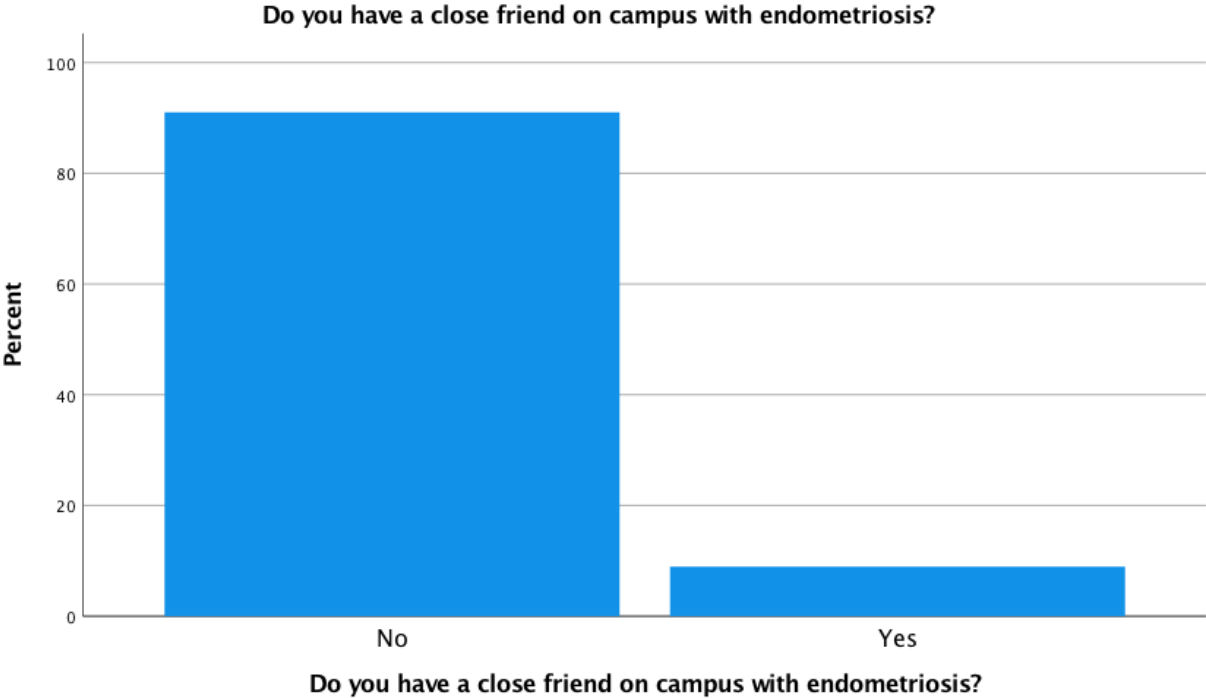
A majority of the participants, 45 (67.2%) lived off-campus and in/around Kalamazoo, Michigan. Seventeen (25.4%) participants lived off-campus and away from Kalamazoo, Michigan. Five (7.5%) participants lived on-campus.

Histogram 1: Participants Diagnosed with Endometriosis



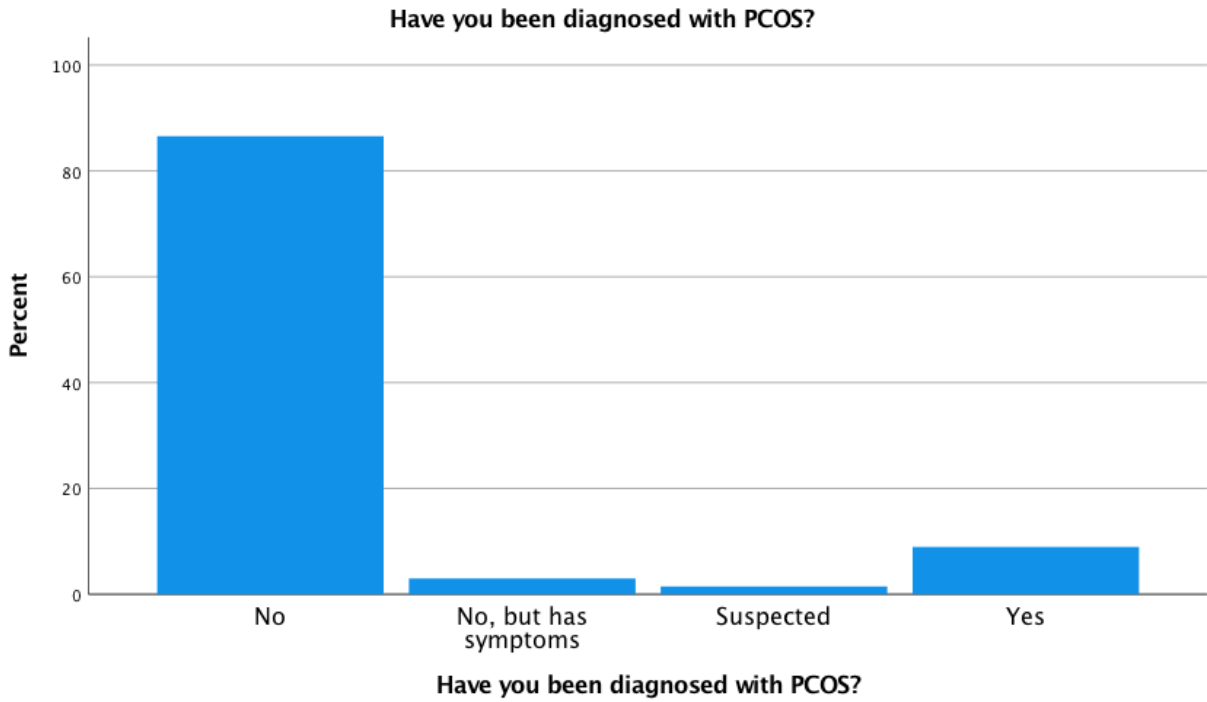
Three (4.5%) of the participants had been diagnosed with endometriosis. The participants in the “Suspected” category, 3 (4.5%), were not officially diagnosed although their gynecologist or primary care physician suspected them to have endometriosis. Participants, 3 (4.5%), in the “No, but has symptoms” category were not officially diagnosed with the health condition although they were experiencing symptoms meaning they may have the condition. Fifty-eight (86.6%) participants did not have endometriosis.

Histogram 2: Participants with Close Friends with Endometriosis



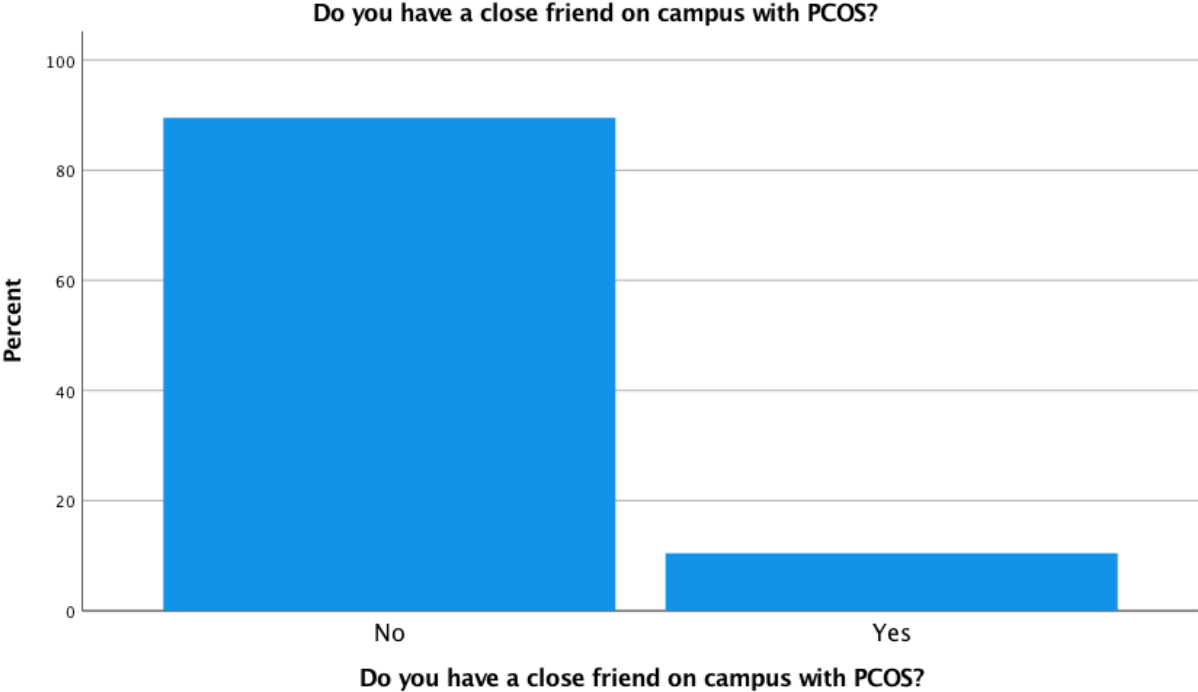
Six (9%) participants had at least one close friend on campus that was living with endometriosis.

Histogram 3: Participants Diagnosed with PCOS



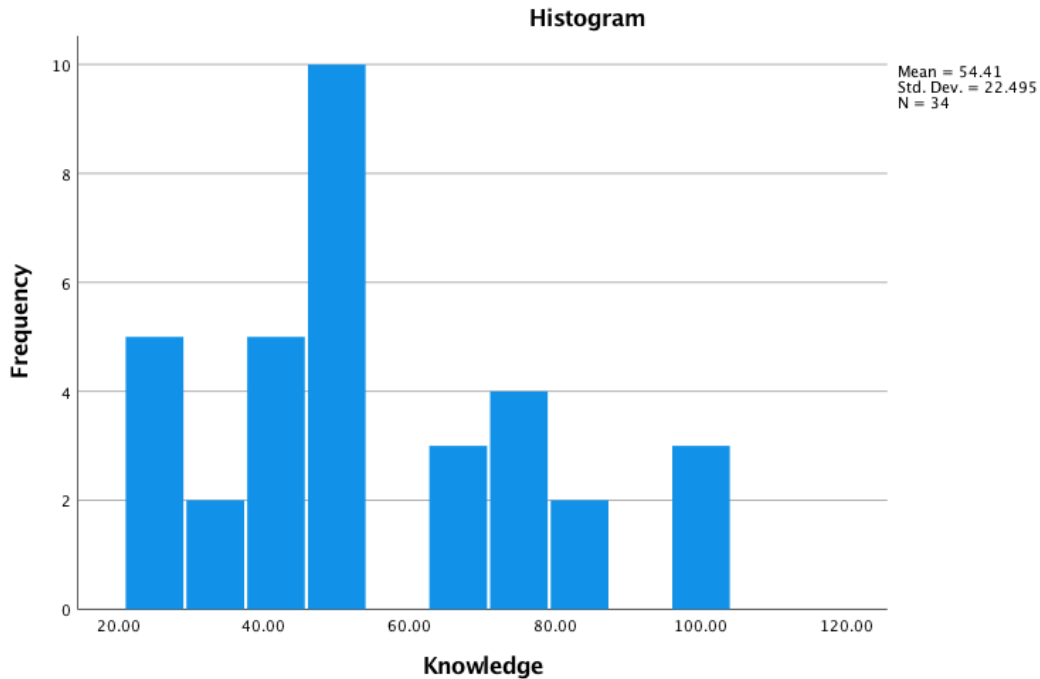
Six (9%) of participants had been diagnosed with polycystic ovarian syndrome (PCOS). One participant (1.5%) was suspected to have PCOS. There were 2 (3%) participants that fell into the “No, but has symptoms” category. Fifty-eight (86.6%) of participants did not have PCOS.

Histogram 4: Participants with Close Friends with PCOS



Seven (10.4%) participants had at least one close friend on campus that was living with PCOS.

Histogram 5: Average Knowledge Scores



The x-axis was the participant's total knowledge scores, listed as percentages. The y-axis was the number (frequency) of participants that received a certain total knowledge score. Participants were asked to self-report their level of understanding on the following areas: familiarity with related anatomy, knowledge of endometriosis and PCOS, understanding of various treatment options, awareness of possible lifestyle changes, finding current research, and explaining endometriosis and PCOS to someone who had never heard of them. The average score from all of the knowledge questions was used. The scoring system: Excellent (4), Good (3), Average (2), and Poor (1). To create a percentage score: 4 (100%), 3 (75%), 2 (50%) and 1 (0%). The average knowledge scored was depicted in a percentage with 100% as the highest score possible. The minimum and maximum knowledge scores were 25% and 100%, respectively with a mean score of 54.4%.

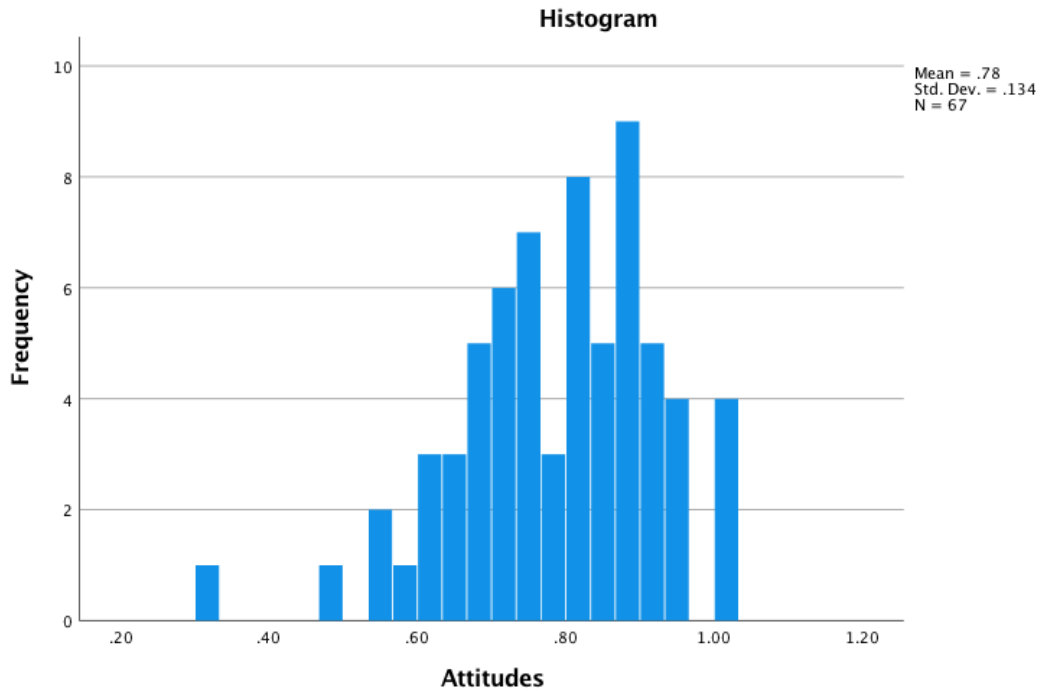
Table 2: Relationship between Knowledge and Overall Health

		Correlations						
		Overall Health	Understand anatomy	Understand knowledge	Understand treatment	Understand lifestyle	Understand research	Understand explain
Overall Health	Pearson Correlation	1	.145	.183	.279	.178	.224	.186
	Sig. (2-tailed)		.405	.292	.105	.305	.196	.291
	N	67	35	35	35	35	35	34
Understand anatomy	Pearson Correlation	.145	1	.822**	.677**	.698**	.645**	.790**
	Sig. (2-tailed)	.405		<.001	<.001	<.001	<.001	<.001
	N	35	35	35	35	35	35	34
Understand knowledge	Pearson Correlation	.183	.822**	1	.863**	.724**	.728**	.890**
	Sig. (2-tailed)	.292	<.001		<.001	<.001	<.001	<.001
	N	35	35	35	35	35	35	34
Understand treatment	Pearson Correlation	.279	.677**	.863**	1	.814**	.836**	.875**
	Sig. (2-tailed)	.105	<.001	<.001		<.001	<.001	<.001
	N	35	35	35	35	35	35	34
Understand lifestyle	Pearson Correlation	.178	.698**	.724**	.814**	1	.824**	.732**
	Sig. (2-tailed)	.305	<.001	<.001	<.001		<.001	<.001
	N	35	35	35	35	35	35	34
Understand research	Pearson Correlation	.224	.645**	.728**	.836**	.824**	1	.682**
	Sig. (2-tailed)	.196	<.001	<.001	<.001	<.001		<.001
	N	35	35	35	35	35	35	34
Understand explain	Pearson Correlation	.186	.790**	.890**	.875**	.732**	.682**	1
	Sig. (2-tailed)	.291	<.001	<.001	<.001	<.001	<.001	
	N	34	34	34	34	34	34	34

** . Correlation is significant at the 0.01 level (2-tailed).

None of the knowledge questions (listed on the left most column in Table 2) had strong correlations with the overall health measure. For the purpose of designing a program, the two highest correlations were chosen. The highest was understanding possible treatment options in relationship to overall health status, $r = 0.279$, $n = 35$, $p = 0.105$. The second highest was understanding how to find current research in relationship to overall health status, $r = 0.224$, $n = 35$, $p = 0.196$.

Histogram 6: Average Attitude Scores



The x-axis was the average total attitude score. The y-axis was the number (frequency) of participants that received that score. Likert scales were used in the survey for the attitude-related questions. Participants were asked to self-report their feelings (anxiety, easement, embarrassment, comfort, and shame) on talking about reproductive health issues with their friends, current or future partner and family. The attitude score was an average of the answers to 15 questions. The scoring was as follows: Rarely (1), Sometimes (2), Often (3) and Always (4). The anxious, embarrassed and shame were reversed scored: Rarely (4), Sometimes (3), Often (2), and Always (1). This way a high attitude score is ideal. The total scores were then converted to a portion out of 1.0. The minimum attitude was 0.32 and the maximum was 1.0. The average was 0.78.

Table 3: Relationship between Attitudes between Friends and Overall Health

		Correlations					
		Overall Health	Friends anxious	Friends easy	Friends embarrassed	Friends comfortable	Friends shame
Overall Health	Pearson Correlation	1	.068	.435**	.244*	.494**	.148
	Sig. (2-tailed)		.587	<.001	.047	<.001	.233
	N	67	67	67	67	67	67
Friends anxious	Pearson Correlation	.068	1	.420**	.561**	.296*	.467**
	Sig. (2-tailed)	.587		<.001	<.001	.015	<.001
	N	67	67	67	67	67	67
Friends easy	Pearson Correlation	.435**	.420**	1	.478**	.677**	.276*
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	.024
	N	67	67	67	67	67	67
Friends embarrassed	Pearson Correlation	.244*	.561**	.478**	1	.466**	.584**
	Sig. (2-tailed)	.047	<.001	<.001		<.001	<.001
	N	67	67	67	67	67	67
Friends comfortable	Pearson Correlation	.494**	.296*	.677**	.466**	1	.285*
	Sig. (2-tailed)	<.001	.015	<.001	<.001		.020
	N	67	67	67	67	67	67
Friends shame	Pearson Correlation	.148	.467**	.276*	.584**	.285*	1
	Sig. (2-tailed)	.233	<.001	.024	<.001	.020	
	N	67	67	67	67	67	67

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

A relationship between self-reported feelings by the participant on how they felt (on two emotions) when talking about reproductive health issues with their friends and their overall health status was statistically significant at the 99% confidence level. The correlation between feelings of ease and overall health status was $r = 0.435$, $n = 67$, $p < 0.001$. The correlation between feelings of comfort and overall health status was $r = 0.494$, $n = 67$, $p < 0.001$.

Table 4: Relationship between Attitudes between Partners and Overall Health

		Correlations					
		Overall Health	Partner anxious	Partner easy	Partner embarrassed	Partner comfortable	Partner shame
Overall Health	Pearson Correlation	1	.187	.346**	.176	.356**	.387**
	Sig. (2-tailed)		.130	.004	.155	.003	.001
	N	67	67	67	67	67	67
Partner anxious	Pearson Correlation	.187	1	.392**	.479**	.372**	.532**
	Sig. (2-tailed)	.130		.001	<.001	.002	<.001
	N	67	67	67	67	67	67
Partner easy	Pearson Correlation	.346**	.392**	1	.474**	.803**	.402**
	Sig. (2-tailed)	.004	.001		<.001	<.001	<.001
	N	67	67	67	67	67	67
Partner embarrassed	Pearson Correlation	.176	.479**	.474**	1	.628**	.539**
	Sig. (2-tailed)	.155	<.001	<.001		<.001	<.001
	N	67	67	67	67	67	67
Partner comfortable	Pearson Correlation	.356**	.372**	.803**	.628**	1	.316**
	Sig. (2-tailed)	.003	.002	<.001	<.001		.009
	N	67	67	67	67	67	67
Partner shame	Pearson Correlation	.387**	.532**	.402**	.539**	.316**	1
	Sig. (2-tailed)	.001	<.001	<.001	<.001	.009	
	N	67	67	67	67	67	67

** . Correlation is significant at the 0.01 level (2-tailed).

A relationship between self-reported feelings by the participant on how they felt (on three emotions) when talking about reproductive health issues with their current/future partner and their overall health status was statistically significant at the 99% confidence level. The correlation between feelings of ease and overall health status was $r = 0.346$, $n = 67$, $p = 0.004$. The correlation between feelings of comfort and overall health status was $r = 0.356$, $n = 67$, $p = 0.003$. The correlation between feelings of shame and overall health status was $r = 0.387$, $n = 67$, $p = 0.001$.

Table 5: Relationship between Attitudes between Family and Overall Health

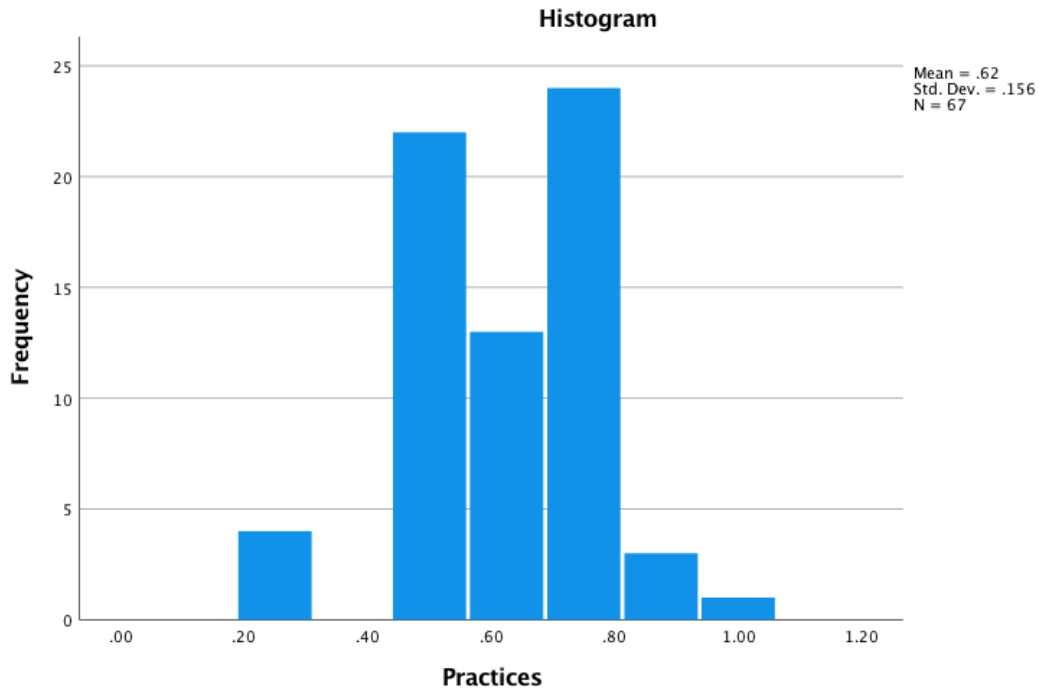
		Correlations					
		Overall Health	Family anxious	Family easy	Family embarrassed	Family comfortable	Family shame
Overall Health	Pearson Correlation	1	.305*	.560**	.394**	.577**	.377**
	Sig. (2-tailed)		.012	<.001	<.001	<.001	.002
	N	67	67	67	67	67	67
Family anxious	Pearson Correlation	.305*	1	.454**	.640**	.411**	.538**
	Sig. (2-tailed)	.012		<.001	<.001	<.001	<.001
	N	67	67	67	67	67	67
Family easy	Pearson Correlation	.560**	.454**	1	.477**	.821**	.408**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001
	N	67	67	67	67	67	67
Family embarrassed	Pearson Correlation	.394**	.640**	.477**	1	.438**	.764**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001
	N	67	67	67	67	67	67
Family comfortable	Pearson Correlation	.577**	.411**	.821**	.438**	1	.318**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		.009
	N	67	67	67	67	67	67
Family shame	Pearson Correlation	.377**	.538**	.408**	.764**	.318**	1
	Sig. (2-tailed)	.002	<.001	<.001	<.001	.009	
	N	67	67	67	67	67	67

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

A relationship between self-reported feelings by the participant on how they felt (on four emotions) when talking about reproductive health issues with their family members and their overall health status was statistically significant at the 99% confidence level. The correlation between feelings of ease and overall health status was $r = 0.560$, $n = 67$, $p < 0.001$. The correlation between feelings of comfort and overall health status was $r = 0.577$, $n = 67$, $p < 0.001$. The correlation between feelings of shame and overall health status was $r = 0.377$, $n = 67$, $p = 0.002$.

Histogram 7: Average Practice Scores



The practice-related questions were the likelihood of the participant attending an educational workshop on the topics of endometriosis and PCOS. Likert scales were also used here for with the scoring: Strongly Likely (4), Likely (3), Unlikely (2) and Strongly Unlikely (1). The total scores were then converted to a portion out of 1.0. A higher mean score in practice meant and increase in the likelihood of attending workshops. The mean practice score was 0.62 with a minimum at 0.25 and a maximum of 1.0.

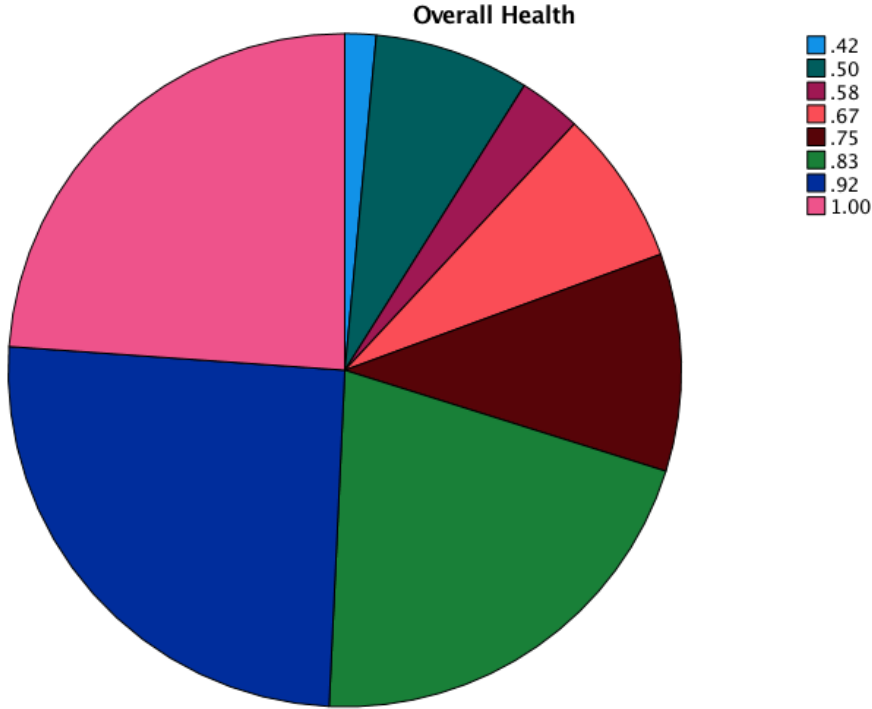
Table 4: Relationship between Practices and Overall Health

		Overall Health	Workshop endo	Workshop PCOS
Overall Health	Pearson Correlation	1	.078	.219
	Sig. (2-tailed)		.531	.074
	N	67	67	67
Workshop endo	Pearson Correlation	.078	1	.682**
	Sig. (2-tailed)	.531		<.001
	N	67	67	67
Workshop PCOS	Pearson Correlation	.219	.682**	1
	Sig. (2-tailed)	.074	<.001	
	N	67	67	67

** . Correlation is significant at the 0.01 level (2-tailed).

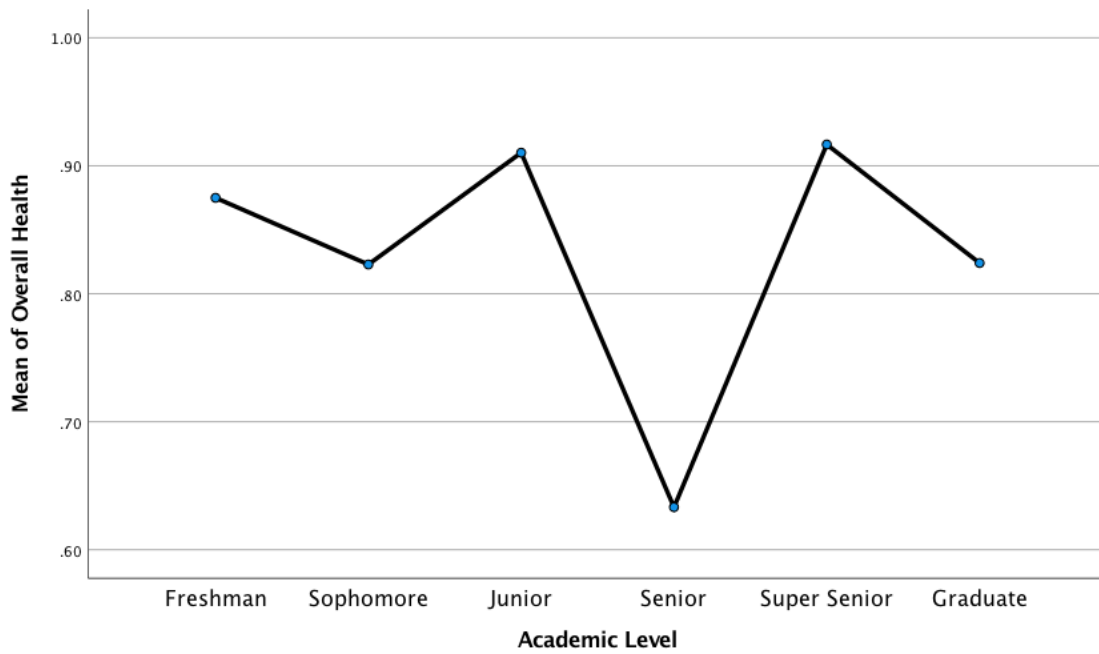
The correlation between a likelihood of attending an educational workshop to learn more about endometriosis and PCOS was statistically significant at the 99% confidence level, $r = 0.682$, $n = 67$, $p < 0.001$. This meant that there was a strong interest in both topics among the participant group.

Chart 4: Self-Reported Overall Health Status of Participants



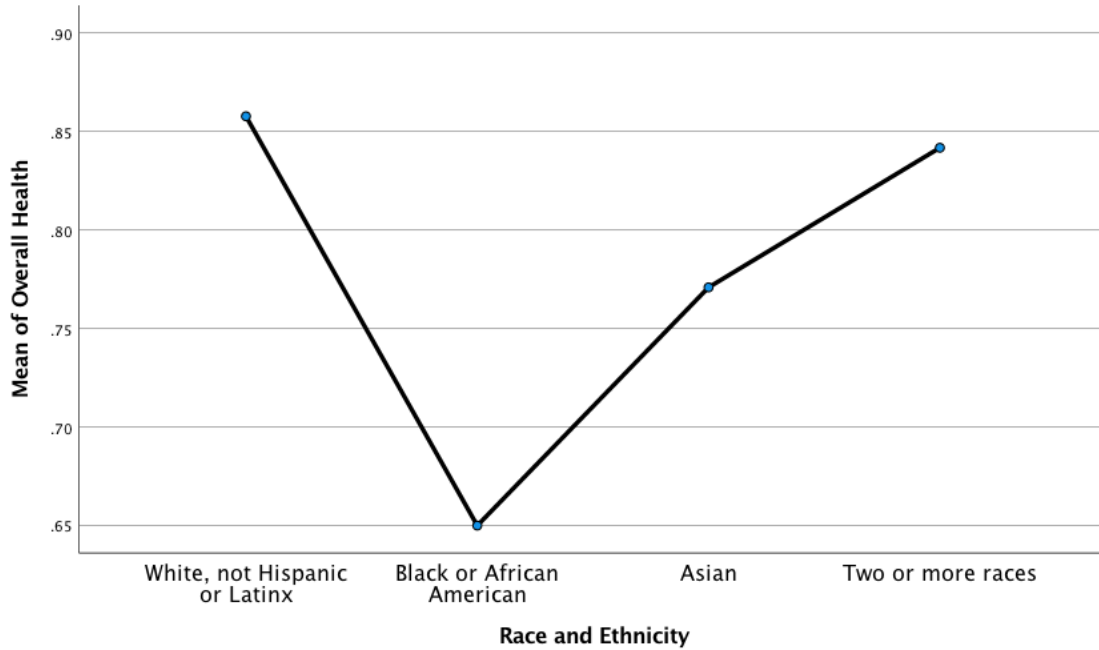
The overall health status measure was the average feeling of support by each participant between their friends, current or future partner, and their family members. These scores were then translated into a portion out of 1.0. The closer to 1.0, the high their overall health status. The mean overall health score was 0.83. The minimum score was 0.42 and the maximum was 1.0.

Graph 1: ANOVA of Academic Level and Overall Health



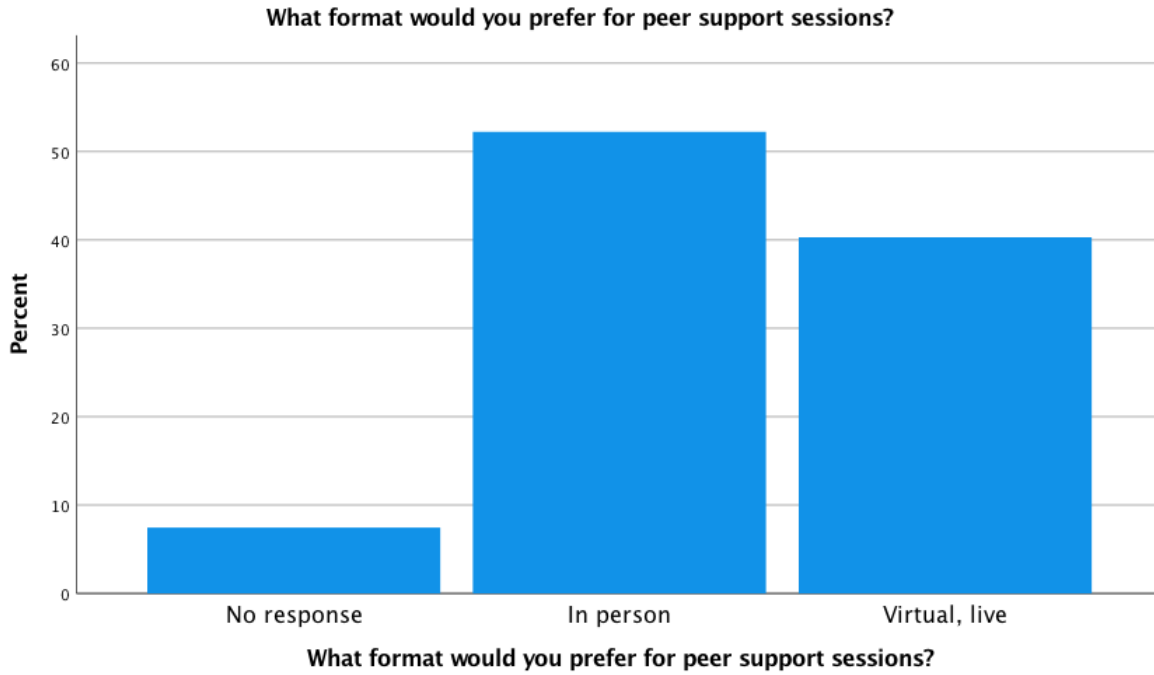
The ANOVA showed an analysis of variance between the participant's academic level and their overall health status. The Seniors reported the lowest average overall health score at 0.63.

Graph 2: ANOVA of Race/Ethnicity and Overall Health

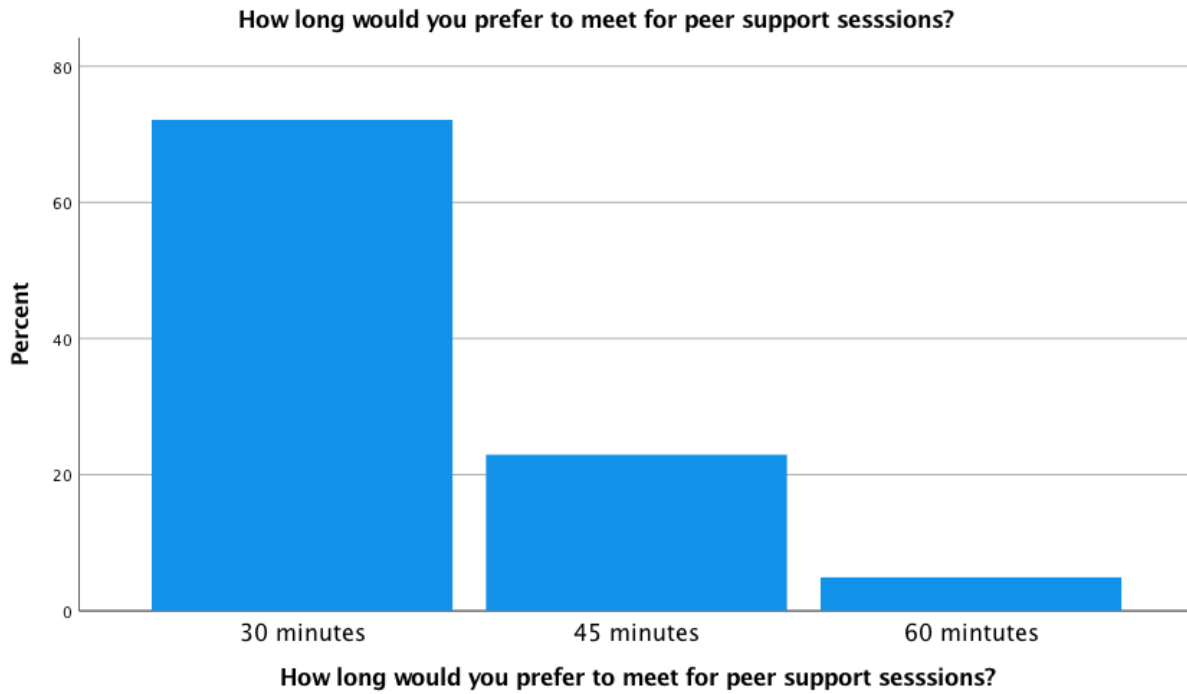


The ANOVA showed an analysis of variance between the participant's race and ethnicity with their overall health status. The white, not Hispanic or Latinx participants had a mean overall health status of 0.86 and the participants that were two or more races had a mean of 0.83. The Asian participants had the next lowest mean of overall health status at 0.77. The Black or African American participants had the lowest mean of overall health status at 0.65.

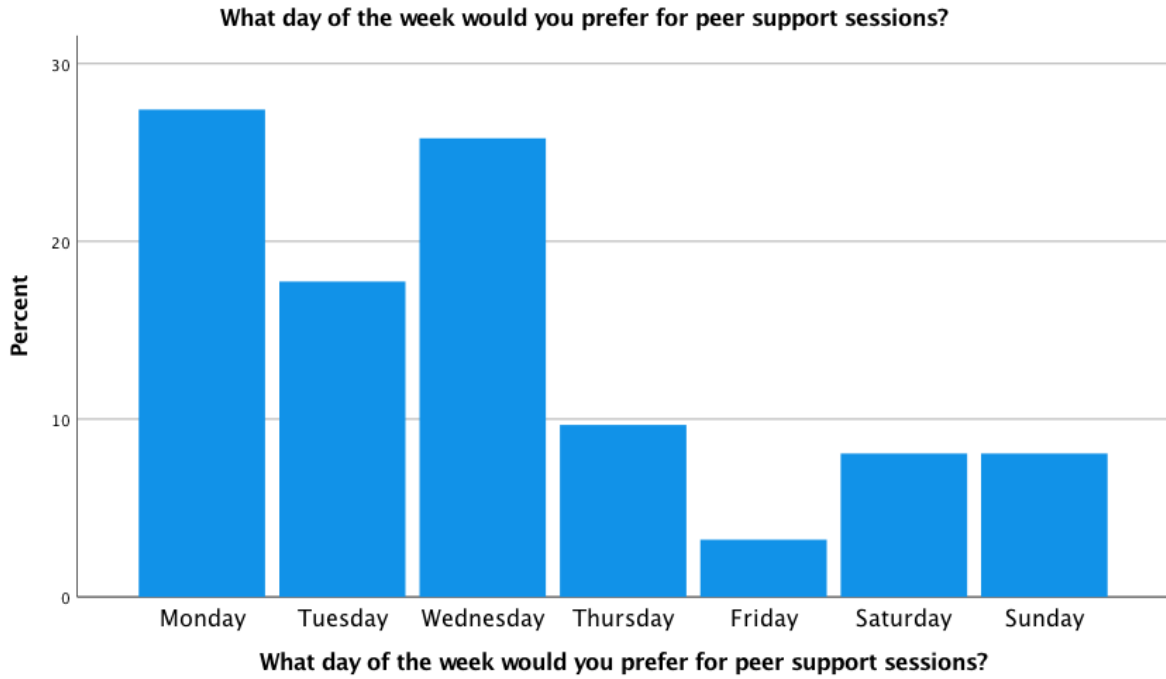
Histogram 8: Preferred Format for Peer Support Sessions



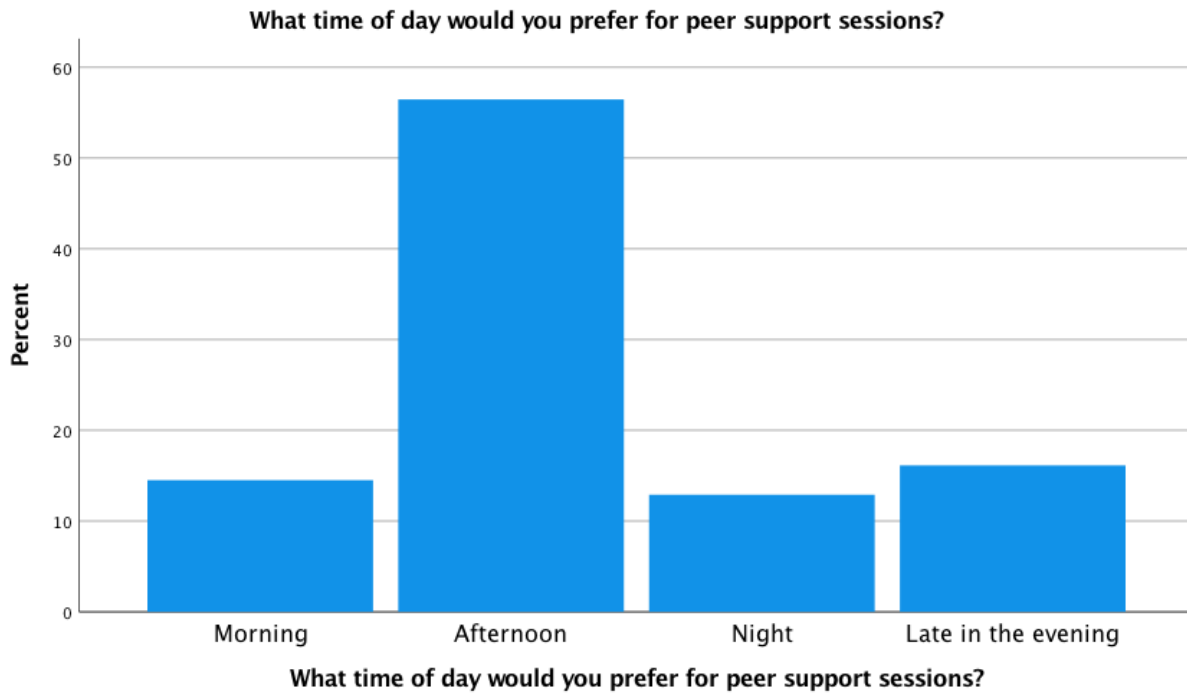
Histogram 9: Preferred Time for Peer Support Sessions



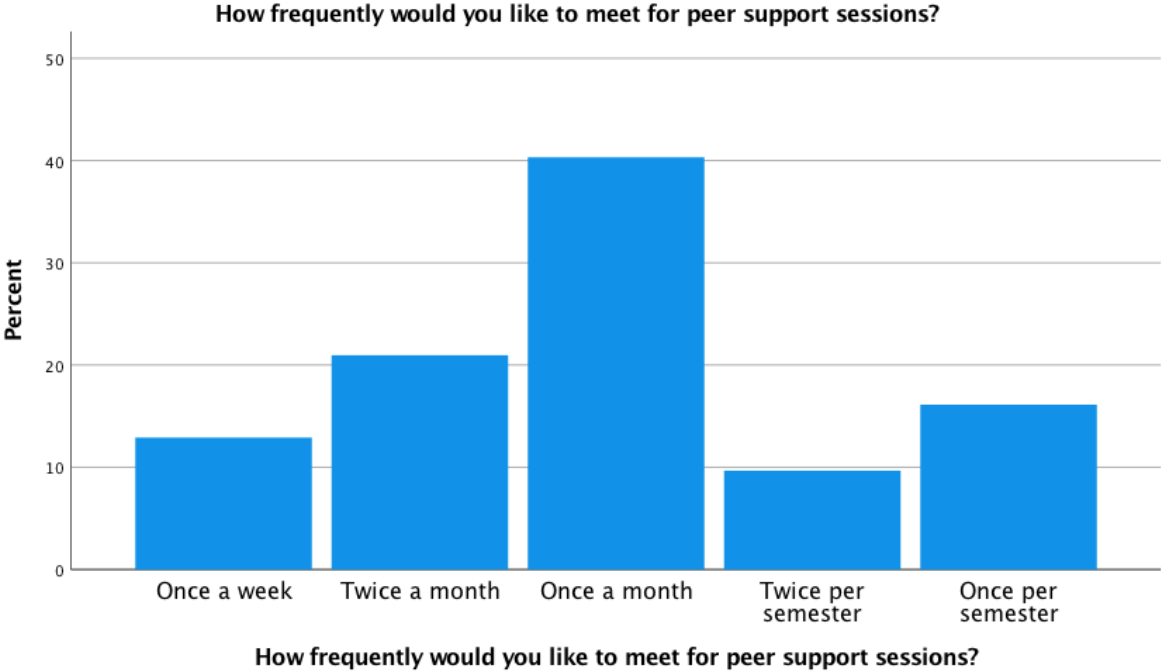
Histogram 10: Preferred Day for Peer Support Sessions



Histogram 11: Preferred Time of Day for Peer Support Sessions

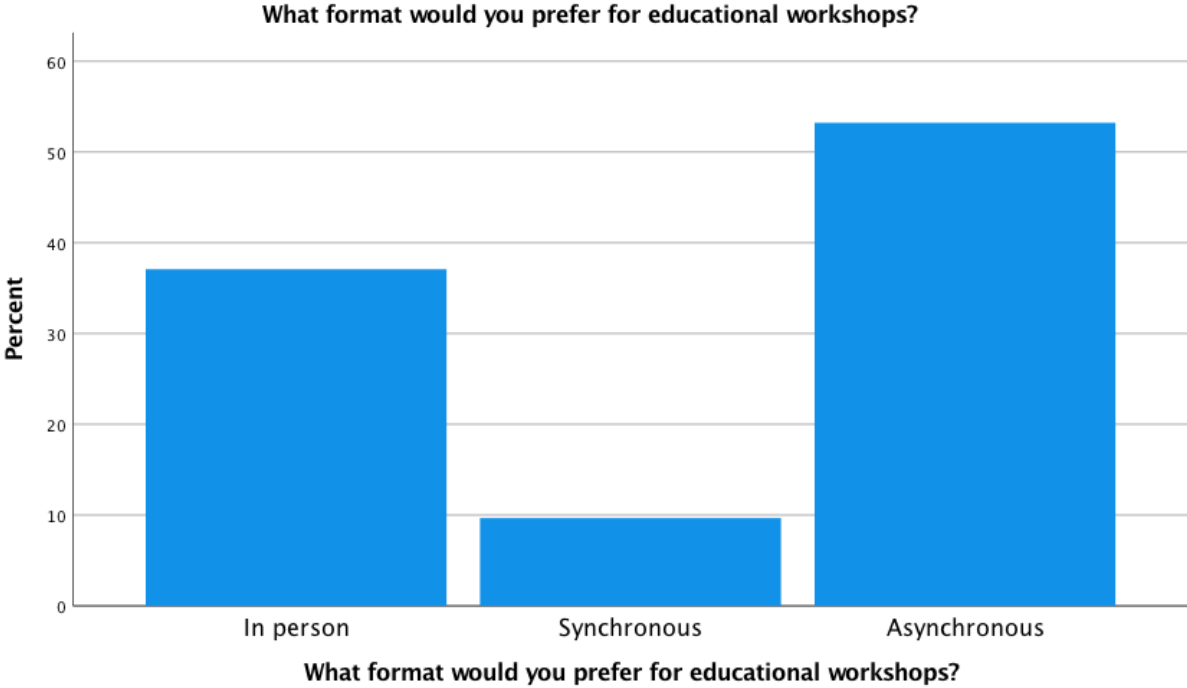


Histogram 12: Preferred Time between Peer Support Sessions



From Histograms 8-12, the most popular way to run peer support sessions would be in person, lasting 30 minutes, on Monday afternoons monthly.

Histogram 13: Preferred Format for Educational Workshops



A majority of students would prefer to work through educational lessons asynchronously. This method would include online sessions where students could learn at their own pace and on their own time.

Discussion

Overall Health:

The overall health factor was a mean from the scores on how supported the participants felt with their friends, current or future partner and family on the topic of reproductive health. The assumption is that a participant with higher self-reported feelings of support would have better overall health.

Overall Health and Knowledge

The significance level between the overall health factor and mean knowledge score was $p = 0.176$, meaning that there was not enough significance to be 95% confident that there is a positive relationship between these two variables. Furthermore, there is no significant correlation between any of the 6 questions used to measure the mean knowledge score and the overall health factor of the participant.

Overall Health and Attitudes

The significance level between the overall health factor and mean attitudes score was $p < 0.001$. Meaning that there was enough significance to be 99% confident that there is a positive relationship between these two variables. When comparing the 15 scores used to create the average attitude scores, many had significance levels $p < 0.01$ in comparison with the overall health factor. For attitudes with friends, feelings of easement and comfort were all significant with 99% confidence. For attitudes towards partner, feelings of easement, comfort and shame (reverse scored) were all significant with 99% confidence. With family, feelings of ease, embarrassment (reversed scored), comfort and shame (reverse scored) were all significant with 99% confidence.

Overall Health and Practices

The significance level between the overall health factor and mean attitudes score was $p = 0.188$, meaning that there was not enough significance to be 99% confident that there is a positive relationship between the two variables.

Recommendations:

The most popular choice of format for the peer support sessions was in person (face-to-face), lasting a half hour (30 minutes) on Monday afternoons once a month. The most voted for choice of format for the educational sessions was asynchronous, in a distance learning setup. The second choice was in person (face-to-face), lasting a half hour (30 minutes) on Wednesday afternoons once a month.

The main emphasis for the project should be addressing attitudes (Table 3, 4 and 5), which were found to be statistically significant in correlation to overall health status. The attitudes with family members had more emotions that were statistically significant in correlation to overall compared to friends and current/future partners. The knowledge questions with higher predicted correlations to overall health include the topics of treatment and research (Table 2). Also, Appendix D contains additional comments (qualitative data) from participants.

A major suggestion is to focus the project on students with racial minority backgrounds, specifically those that identify as Black and Asian, as those were the racial and ethnic groups that had lower overall self-reported scores on overall health. The project should also have an emphasis towards increasing health literacy, such as teaching students where to find resources, and not be reliant on students simply memorizing information. There is a lot of research on endometriosis and PCOS, so it is crucial for students to stay up to date on current findings.

Since this capstone only used a needs assessment and did not include implementing this program, the following project management and evaluation plan sections are also meant to be read as recommendations.

Project Management

Goal:

Establish a program to educate and support female students with reproductive health conditions (such as polycystic ovarian syndrome and endometriosis) and their peers at Western Michigan University (WMU).

Objectives:

1. Recruit and maintain female college students from all colleges at WMU for the program.
2. Report 80% of participants in the program attending at least 3 out of 4 of monthly peer support sessions.
3. Have 75% or more of participants complete all educational modules by the end of the semester.

Activities:

Recruit and maintain female students from all colleges at WMU for the program.

- 1.1 Create an informational, recruitment flyer on Canva with a QR code that links to a GroupMe chat for the program.
- 1.2 Have 50 print flyers stamped with approval.
- 1.3 Email every president of a registered student organization (RSO) and Resident Life to ask if they could share our recruitment flyer.
- 1.4 Disperse program information to all colleges at WMU one month before the start of a new semester to recruit students.

Report 80% of participants in the program attending at least 3 out of 4 of monthly peer support sessions.

2.1 Establish a group in the Office of Health Promotion and Education (or the Center for Counseling and Psychological Services).

2.2 Record attendance at each meeting.

2.3 Distribute care packages to students at the third meeting.

Have 75% or more of participants complete all educational modules by the end of the semester.

3.1 Develop 90% of educational content.

3.2 Design a virtual certificate (PDF) for participants to receive when they complete the educational modules.

3.3 Collect pre- and post-surveys from the students at the start and end of the semester on the virtual, educational modules.

Milestones:

1.1 Welcome 25 WMU students in the GroupMe chat that are interested in learning more about the program.

1.2 Post flyers around WMU's main campus.

1.3 Have 25% of email recipients respond yes to sharing the flyer.

1.4 Receive email notification that all 7 colleges shared the flyer to their students.

2.1 Arrange for guest speakers and health professionals to attend the peer support sessions.

2.2 Have 80% of participants attend the first 2 peer support sessions.

2.3 Make care packages including information on community resources and promotional items (stickers, t-shirts, and more with the program's logo).

3.1 Work with a focus group of the primary audience to edit and build upon the educational module.

3.2 Have 50% of participants finish the educational modules.

3.3 Create pre- and post-surveys for the virtual, educational module.

GANTT Chart:

Activities/Milestones	August	September	October	November	December
1.1					
1.2					
1.3					
1.4					
2.1					
2.2					
2.3					
3.1					
3.2					
3.3					

Focus:

Process

The program’s focuses would be to increase education on the female reproductive health conditions, feelings of support and better overall health status for the students.

Impact

The impact goal is to raise the mean overall health status of college students with female reproductive health conditions at WMU after their participation during a year-long program with peer support sessions and educational modules by 10%. The short-term objectives below make up the impact section.

- Increase the mean of the average knowledge score by 10% among participants.
- Increase the mean of the average attitude score by 10% among participants.
- Have 90% of participants able to explain to someone, who is unfamiliar with either condition, an overview of polycystic ovarian syndrome (PCOS) and endometriosis.

Outcome

The long-term goal is to support involvement efforts around Western Michigan University to increase reach and grow the program. The objectives below contribute to it.

- Raise awareness within the campus community by 5%.
- Establish a RSO to continue the program on campus after the first semester.
- Assemble 10% more participants for the following semester.

Evaluation Plan

The main goal would be to establish a project to educate and support female students with reproductive health conditions, such as PCOS and endometriosis, and their peers at Western Michigan University (WMU). Accordingly, the two initiatives are a peer support group and an online, asynchronous educational module. The main focus for both programs will be on improving the participating students' overall well-being and not just their reproductive health. The peer support group is the secondary prevention initiative, and the educational part is the primary prevention initiative. The intention is for a new registered student organization (RSO) to form that connects the two aspects of the project – the peer support group, in addition to the educational piece that will be offered online.

The knowledge-attitudes-practices (KAP) model forms the framework for the theoretical framework used in this project. These independent/predictor variables are assumed to influence the overall self-reported health of participants in the project. The indicators for the total knowledge component would be the scores on pretests for questions related to the following topics: familiarity with related anatomy/vocabulary, general knowledge of the health conditions, understanding of various treatment options, awareness of possible lifestyle changes, health literacy and the ability to find current research. The overall attitude element would be from self-reported feelings, ranging from comfort to shame, of talking about reproductive health with different groups of people using a Likert scale ranging from strongly agreeing to strongly disagreeing of feeling certain emotions. The practice part would consist of the participants self-reporting a measure of their overall health and well-being.

For the short term, participants are anticipated to have higher scores in all three areas. Furthermore, the goal would be for them to feel that they are not alone, meet new friends, and

have a safe place for their questions. In the long term, participants should be aware of and use community resources in and around campus share. Another outcome is to maintain the RSO.

The evaluation topics below contribute to the short- and long-term impact expected for the suggested project.

- Increase in the participant's total knowledge scores.
- Increase in the participants' attitudes in feeling at ease, comfortable and supportive when talking about reproductive health issues with friends, partners and family members.
- Increase in the participants' self-reported overall health during the program.

The evaluation plan would use both formative and summative methods. The formative methods include the check-ins will be at the end of every peer support session and after each section in the virtual educational module. The summative method for evaluation is the pre- and post-tests. The layout is: $O1 \times O2$. Therefore, the project's effectiveness is equal to $O2 - O1$. The major strength is that this plan allows for a higher internal validity than only using posttests. The weaknesses are that the pretest accounts for what the participants already know (which is anticipated to vary a lot) and that the outcomes are in one cohort group may not be applicable to other groups.

There are more recommendations to follow for success along with the goals, objectives, impacts and outcomes. The following standards need to be met for the project to be considered successful. Participants should represent all seven colleges at the university. The project should provide a welcoming environment for students with various cultures and identities including all ages, races, ethnicities, abilities, socioeconomic statuses, sexualities, regionalities, and spiritual practices/religions. After the pilot year, there may be a plan to offer the educational module for

those without the health conditions. Also, the program should be evaluated by someone outside of the project to decrease bias.

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Appendices

Appendix A. Email Recruitment Template

Appendix B. Consent Form

Appendix C. Survey Questionnaire

Appendix D. Participant Comments from the Survey Questionnaire

Appendix A. Email Recruitment Template

Dear (Professor Name),

As a senior public health student at Western Michigan University, I am reaching out to you regarding my capstone and honors thesis. It is about various primary and secondary interventions (peer support and educational sessions) for college students on the topic of common female reproductive health issues including endometriosis and polycystic ovarian syndrome (PCOS). A major piece of my research is collecting data from a survey questionnaire. I was wondering if you would be able to forward this email (with the consent form and Survey Monkey link) to your current students. The questionnaire takes about 15 to 20 minutes to complete and can be accessed here:

I have attached all of the survey questions in the Word document if you would like to review the content first. Please let me know if you would be able to participate by sharing this to your students and do not hesitate to reach out to me with any questions.

Thank you so much,

Alison Yelsma

Appendix B. Consent Form

**Western Michigan University
College of Health and Human Services
School of Interdisciplinary Health Programs
Public Health Department**

Principal Investigator: Dr. Amos O. Aduroja
Student Investigator: Alison Yelsma
Title of Study: Primary and Secondary Interventions to Address Common Female Reproductive Health Issues on College Campuses

You are invited to participate in this research project titled "*Primary and Secondary Interventions to Address Common Female Reproductive Health Issues on College Campuses*"

STUDY SUMMARY: This consent form is part of an informed consent process for a research study and it will provide information that will help you decide whether you want to take part in this study. Participation in this study is completely voluntary. The purpose of the research is to gauge what could be done to help support and educate college students on the topics of endometriosis and polycystic ovarian syndrome (PCOS), which are two common health conditions that effect reproductive health and overall well-being and will serve as Alison Yelsma's public health capstone and honors thesis for the requirements of a Bachelor's of Science in Public Health and for the Lee Honors College respectively. If you take part in the research, you will be asked to answer a questionnaire through the Survey Monkey platform. Your time in the study will take about 15 to 20 minutes to complete the questionnaire. Possible risk and costs to you for taking part in the study may be the time to complete the questionnaire and potential benefits of taking part may be helping the student investigator develop peer support sessions and educational sessions for college students on the topics of, and surrounding, female reproductive health issues. Your alternative to taking part in the research study is not to take part in it.

The following information in this consent form will provide more detail about the research study. Please ask any questions if you need more clarification and to assist you in deciding if you wish to participate in the research study. You are not giving up any of your legal rights by agreeing to take part in this research or by signing this consent form. After all of your questions have been answered and the consent document reviewed, if you decide to participate in this study, you will be asked to sign this consent form.

What are we trying to find out in this study?

Endometriosis and polycystic ovarian syndrome (PCOS) are two common health conditions that effect reproductive health and overall well-being. These questions were designed to gauge what could be done to help support and educate students on this topic. The responses will be used to help develop suggested interventions for use in a college setting.

Who can participate in this study?

This survey is open to all female students – not just those who have the health conditions in discussion.

Where will this study take place? The data collection will take place through the questionnaire through the Survey Monkey platform.

What is the time commitment for participating in this study?

The time commitment is 15 to 20 minutes to complete the questionnaire.

What will you be asked to do if you choose to participate in this study?

The potential participants are asked to complete a questionnaire to participate in this study.

What information is being measured during the study? The set of questions are designed to elicit information about you (demographics), the process of developing a program and the content to be covered in the program. Information provided by you will adhere to the ethical standards expected by University IRB in confidentiality and anonymity; you should therefore be free to be honest in your responses.

What are the risks of participating in this study and how will these risks be minimized?

Other than taking up approximately 15 to 20 minutes of each participant's time there are no other known risks from this research.

What are the benefits of participating in this study? There are no direct benefits to the participants of this study identified. The research may help in the development of peer support sessions and educational sessions for college students on the topics of, and surrounding, female reproductive health issues. Those interventions may be important in helping college students that have endometriosis or polycystic ovarian syndrome (PCOS).

Are there any costs associated with participating in this study?

There are no costs associated with participating in this study.

Is there any compensation for participating in this study?

This is not any compensation for participating in this study.

Who will have access to the information collected during this study?

To guarantee confidentiality of the student participants, names and any other identifying factor will not be collected. After the data is enter, the questionnaire will be deleted. All of the information gathered will only be used in this study and not used by or distributed for other research.

What will happen to my information or biospecimens collected for this research project after the study is over?

The information collected about you for this research will not be used by or distributed to investigators for other research.

What if you want to stop participating in this study? You can choose to stop participating in the study at anytime for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences either academically or personally if you choose to withdraw from this study.

Should you have any questions prior to or during the study, you can contact the principal investigator, Dr, Amos O. Aduroja, at 734-644-6654 or amos.aduroja@wmich.edu or the student investigator, Alison Yelsma, at 269-569-5544 or alison.yelsma@wmich.edu. You may also contact the Chair, Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This study was approved by the Western Michigan University Institutional Review Board (WMU IRB) on November 29, 2020.

Participating in this survey online indicates your consent for use of the answers you supply.

Appendix C. Survey Questionnaire

Purpose: Endometriosis and polycystic ovarian syndrome (PCOS) are two common health conditions that effect reproductive health and overall well-being. These questions were designed to gauge what could be done to help support and educate students on this topic. The responses will be used to help develop suggested interventions for use in a college setting. This survey is open to all female students – not just those who have the health conditions in discussion.

Description: Since this questionnaire is done virtually, the researcher will not be able to see who the respondents are. This ensures confidentiality for those that voluntarily complete the questionnaire. The estimated time to finish this survey is 15 to 20 minutes.

The set of questions below are designed to elicit information about you (demographics), the process of developing a program and the content to be covered in the program. Information provided by you will adhere to the ethical standards expected by University IRB in confidentiality and anonymity; you should therefore be free to be honest in your responses.

Please fill in only one option from the choices listed for each question.

Demographic Questions

1. Age in years: _____
2. Gender
 - a. Female
 - b. Male
 - c. Transgender
 - d. Non-binary
 - e. Different identity (leave short answer)
3. Academic level
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Super Senior/ Fifth Year student
 - f. Graduate Student
4. Race and ethnicity
 - a. White, not Hispanic or Latinx
 - b. Hispanic or Latinx
 - c. Black or African American
 - d. Asian
 - e. American Indian or Alaska Native
 - f. Native Hawaiian or Other Pacific Islander
 - g. Two or more races

5. Current living situation
 - a. On-campus living
 - b. Off-campus living, in or around Kalamazoo
 - c. Off-campus living, away from Kalamazoo

Process and Content Questions

1. Have you been diagnosed with **endometriosis**?
 - a. Yes
 - b. No
 - c. My gynecologist/physician suspects me to have it although I am not officially diagnosed.
 - d. No, but I am experiencing symptoms of endometriosis.
2. Do you have a close friend on campus with **endometriosis**?
 - a. Yes
 - b. No
3. I am likely to attend an educational workshop to learn more about **endometriosis**. (Regardless if you have the diagnosis or not.)
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
4. Have you been diagnosed with **polycystic ovarian syndrome (PCOS)**?
 - a. Yes
 - b. No
 - c. My gynecologist/physician suspects me to have it although I am not officially diagnosed.
 - d. No, but I am experiencing symptoms of PCOS
5. Do you have a close friend on campus with **PCOS**?
 - a. Yes
 - b. No
6. I am likely to attend an educational workshop to learn more about **PCOS**. (Regardless if you have the diagnosis or not.)
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
7. Please rate your feelings on talking about reproductive health issues with your **friends**.

	Always	Often	Sometimes	Rarely
Anxious				
Easy				
Embarrassed				
Comfortable				
Shame				
Supported				

8. Please rate your feelings on talking about reproductive health issues with your **current or future partner**.

	Always	Often	Sometimes	Rarely
Anxious				
Easy				
Embarrassed				
Comfortable				
Shame				
Supported				

9. Please rate your feelings on talking about reproductive health issues with your **family**.

	Always	Often	Sometimes	Rarely
Anxious				
Easy				
Embarrassed				
Comfortable				
Shame				
Supported				

10. If you are diagnosed with endometriosis or PCOS how many different health professionals did you see to get diagnosed with the health condition? _____

11. What format would you prefer for a **peer support session**?

- a. In person, face to face
- b. Virtual, synchronous (live)

12. How long would you prefer to meet for a peer support session?

- a. 30 minutes
- b. 45 minutes
- c. 60 minutes (1 hour)
- d. 90 minutes (1.5 hours)
- e. 120 minutes (2 hours)

13. What day of the week would you prefer to have a peer support session?

- a. Monday
- b. Tuesday

- c. Wednesday
- d. Thursday
- e. Friday
- f. Saturday
- g. Sunday

14. What time of day would you prefer to have a peer support session?

- a. Morning
- b. Afternoon
- c. Night
- d. Late in the evening

15. How frequently would you like to meet for a peer support session?

- a. Once a week
- b. Twice a month
- c. Once a month
- d. Twice per semester
- e. Once per semester

16. Please rate your **level of understanding** on the following areas:

	Excellent	Good	Average	Poor
Familiarity with related anatomy				
Knowledge of endometriosis/PCOS				
Understanding of various treatment options				
Awareness of possible lifestyle changes				
Finding current research				
Explaining endometriosis/PCOS to someone who has never heard of it				

17. If offered, what format would you prefer for **educational sessions**?

- a. In person, face to face
- b. Virtual, synchronous (live)
- c. Virtual, asynchronous (go at your own pace)

18. How long would you prefer to meet for an educational session if it was in person or virtual?

- a. 30 minutes
- b. 45 minutes
- c. 60 minutes (1 hour)
- d. 90 minutes (1.5 hours)
- e. 120 minutes (2 hours)

19. What day of the week would you prefer to have an educational session?

- a. Monday
- b. Tuesday
- c. Wednesday
- d. Thursday
- e. Friday
- f. Saturday
- g. Sunday

20. What time of day would you prefer to have an educational session?

- a. Morning
- b. Afternoon
- c. Night
- d. Late in the evening

21. How frequently would you like to meet for an educational session?

- a. Once a week
- b. Twice a month
- c. Once a month
- d. Twice per semester
- e. Once per semester

22. The space below is to provide any comments that you would like to express on any of these topics: (optional)

Thank you so much for spending time to complete this survey!

Appendix D. Participant Comments from the Survey Questionnaire

- I do not have either of these conditions, but have both close friends and family with both. I know very little about them and would be interested in informational sessions about them, as a female, to support those friends and family.
- I am working with a physician currently regarding my symptoms of endometriosis and should be having the exploratory surgery soon. I had to be my own advocate to finally be tested, after experiencing symptoms for the last 2 years.
- i have no comments. this survey was done and designed nicely
- None at this time. Thanks!
- I have known people who have had these diagnoses before so I know about the condition pretty well as well as learned about some of them through other situations.
- I appreciate the survey being done. Reproductive issues are hard to talk about, but are now (for me) becoming easier to speak out about. Most of the time people don't realize that they're symptoms aren't normal and by providing awareness of these conditions, it may help someone else relieve their suffering.
- These sessions would be very helpful and informative to students across campus.
- Great survey!
- I think this is a great idea